FOUNDRY TRADE JOURNAL

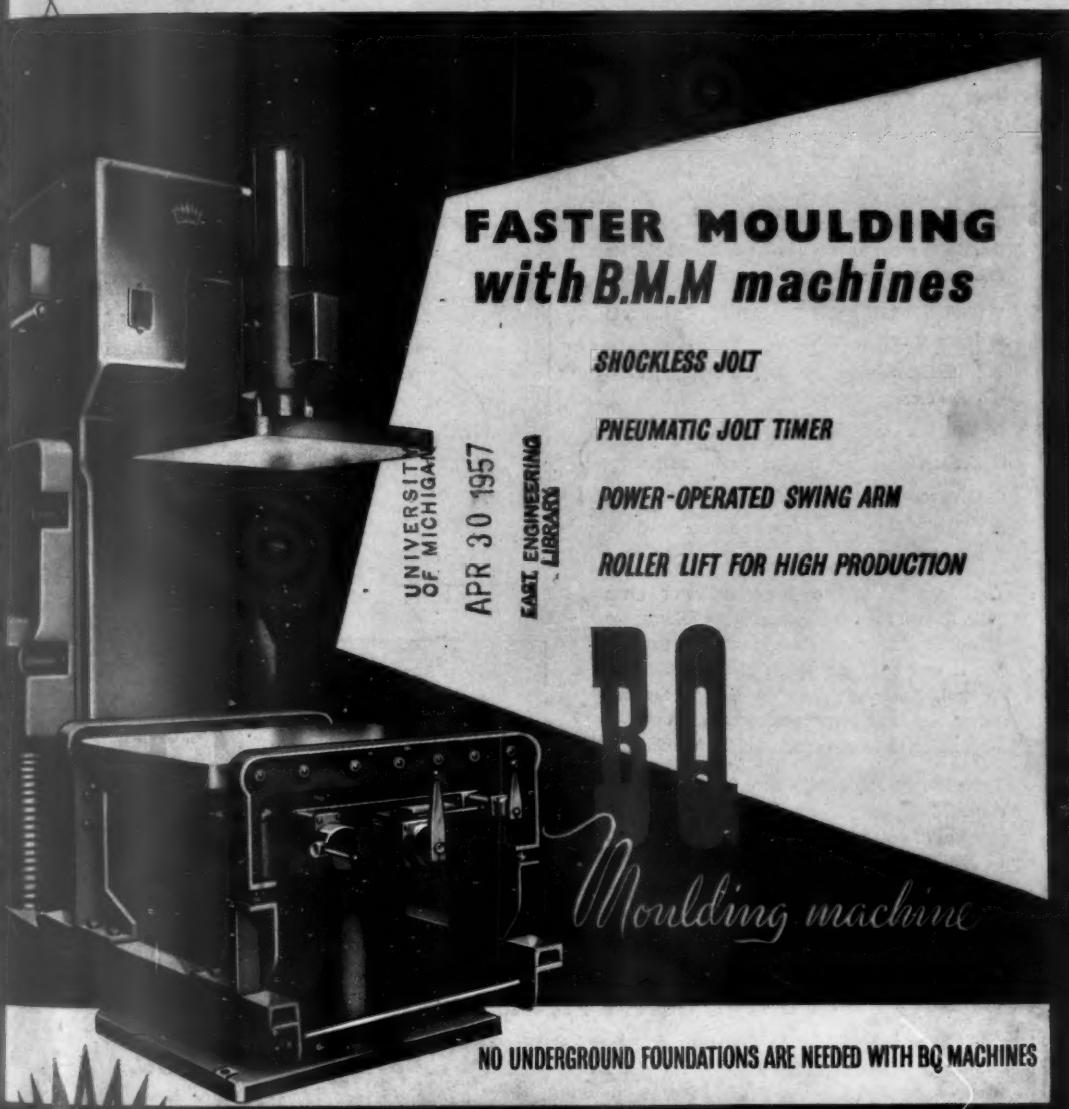
EST. 1902

WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

VOL. 102
No. 2113
Registered at the G.P.O. as a Newspaper

APRIL 11, 1957
Offices: John Adam House, John Adam St., London, W.C.2

Single Copy, 9d. By Post 1/-. Annual Subscription, Home 40/-, Abroad 45/- (Prepaid)



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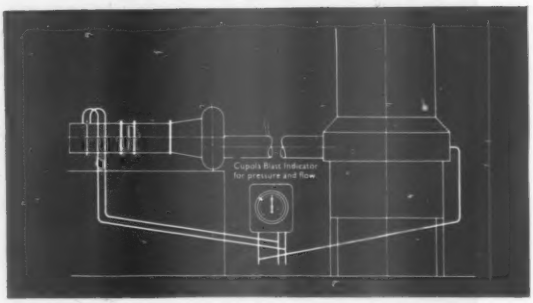

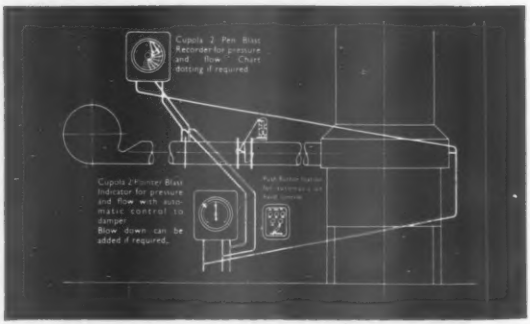
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FOUNDRY TRADE JOURNAL

Established 1902

Vol. 102 Thursday, April 11, 1957 No. 2113

Editor:
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AN INDUSTRIAL NEWSPAPERS PUBLICATION

Published Weekly

Single copy 9d.: by post 1s.
Annual subscription: home 40s., abroad 45s. (prepaid)

17/19 JOHN ADAM STREET, ADELPHI, LONDON, W.C.2

'Phone: TRAfalgar 6171 (10 lines)
'Grams: Zacatecas, Rand, London

Enthusiasm Renewed

The ninth Foundry Foremen's Training Course, which was held last Friday and Saturday in Harrogate, was not quite as well attended as in previous years because of the recent labour stoppages in some areas. At such times, the services of foremen are especially needed to reorganize the apprentices and to ensure everything is ready for a quick restart. Whilst there was no particular theme attached to the Course, it did seem to us that throughout stress was laid on the intelligent application of controls—laboratory control, costing control, safety control, and control through inspection. Only in Mr. Rice's lecture on "Newer Foundry Processes" was control indicated rather than stressed. Thus, for instance, the audience was told that to get the best results from the CO_2 Process the time of gassing must be controlled; the clay content of the sands must be increased in certain instances, and so forth.

Mr. Hallett's lecture on "Why Have a Laboratory?" recalled the early antagonism between the chemist and the foundryman. We believe this was due to the fact that neither understood the other's *metier* and felt somewhat awkward in conversation, unless one of the parties had a natural gift of understanding and friendliness. As Mr. Hallett developed his theme, it was made clear that the laboratory provides data by means of which the intelligent foreman can and very largely does control the processes. Mr. Judd, in his paper, showed real genius for putting costing on a simple but rational basis. The analogy of a bunch of men running a house for themselves and sharing the costs equitably will long remain in the minds of his audience. It is reasonably sure that on return from Harrogate, the foremen's interest in this aspect of control will be enhanced to the extent that where instinct tells them that the costing department is wrong in some particular, they will argue on a better basis than was possible before.

We were a little disappointed in the discussions on these lectures. Whilst they could not be characterized as desultory, they lacked the sparkle which lectures from foundry managers who have risen from the floor evoke. Perhaps, the very expertness of the lecturers in their own particular field brought out some feeling of diffidence or shyness, which is not present when the lectures are given by people who obviously "live" on the foundry floor. The objective of these courses is mainly to give the participants useful material which they can take back to their works and apply. Of this sort of data there was full measure and we can assure those enlightened managements who allow their staff to participate that they will reap a rich dividend. At a minimum, this will show itself in renewed enthusiasm for their work.

European Production Prospects

Provided there is no prolonged delay in bringing the Suez Canal into full use, a renewed upturn in European production in the second half of 1957 may be expected, but the expansion is likely to be at a more moderate pace than in recent years. This is the cautious view of short-term industrial prospects in Europe expressed in the "Economic Survey, 1957," presented to Parliament by the Chancellor of the Exchequer.

Expectations of a slowing down of the rate of expansion are influenced by the restrictive measures, monetary and otherwise, taken by most countries before the beginning of the Suez crisis, and the belief that some countries will need to take further measures to correct adverse balances of payments. The indications are nevertheless that markets as a whole will continue to expand.

In the United Kingdom, the outlook will continue to be dominated by the necessities of the balance of payments. Prospects depend mainly on our success in the expansion of exports. There should be no lack of markets, but competition from other manufacturing countries will be keen.

Only two pages of the 48-page survey are devoted to the prospects of trade and industry; in the main the document is a recital of economic trends in 1956. It is noted that overall, industrial production did not expand at all last year. Output of coal was about the same as in 1955. Steel production was up, but did not show the increase expected. The year 1956 saw a halt to the expansion of the metal-using industries.

Latest Foundry Statistics

According to the *Monthly Statistical Bulletin* for February issued by the Iron and Steel Board and the British Iron and Steel Federation, the number of people at work in the steel foundries on January 5, 1957, was 20,470. This figure was 130 fewer than on December 8, but 180 higher than a year ago. The estimated average weekly production of steel castings was 6,600 tons; this figure compares favourably with 5,900 tons for December and 6,200 tons for January 1956.

Wiring a Sand Plant

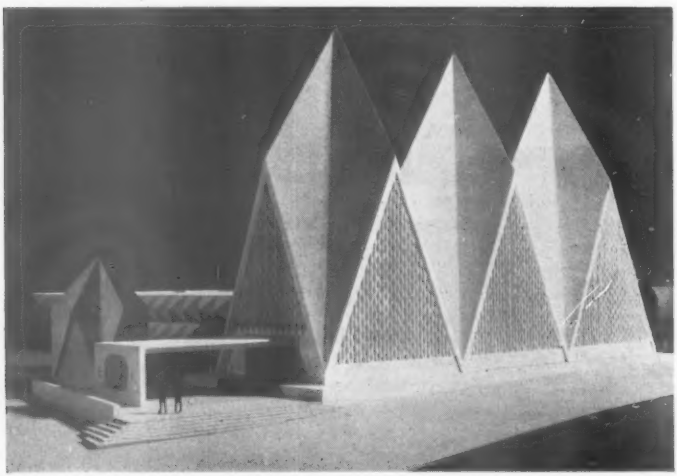
The *ESC Information Bulletin* for March, a news sheet issued by the English Steel Corporation, gives some interesting details of the wiring-up of a sand-preparing plant to be used in conjunction with a Speedslinger—a job which took about 5 to 6 months.

Some idea of the scale and complexity of the job will be gained when it is realized that over 4 miles of wiring were used, 54 motors were installed, ranging from 2 to 75 h.p., while starting and control equipment for 40 of them was incorporated on a control panel. All the wiring for the mimic diagram of hoppers and conveyor belts on the control panel, with its system of flashing lights to indicate flows of sand, had to be laid, and over a thousand connections and junction boxes incorporated. Before starting the sand plant, a sub-station of a 1,000-kw capacity was built. To speed installation of this new equipment, work started on the wiring 4 months before the plant was delivered, so that, when it did arrive, all that remained to do was to connect up.

Forty Years Ago

Some of the titles of the articles printed in the April 17, 1917, issue of the JOURNAL, might easily figure in a current "contents list." For instance, "Titanium in Steel Castings," or "Zirconia as a Refractory," would be topical to-day. In the former article, titanium as ferro-titanium was recommended as a deoxidizer and was used in amount equivalent to 0.10 per cent. addition of metallic Ti. Zirconium was reported as being used successfully as an open-hearth lining. There was a leading article on "The Chemist as a Luxury," where the Editor was of the opinion that if chemists were paid—as they often were—less than £100 per annum and confined to their laboratories, they might well be luxuries.

B.S.A. TOOLS, LIMITED—Mr. A. H. Mason, who has been appointed a director, is the company's chief engineer.



Brussel's Exhibition Next Year

The illustration alongside shows an artist's impression of the Crystalline Hall which is to form the British Government Pavilion for the Brussels World Exhibition of 1958. *This Hall is to be erected in a dominant position and will form the entrance to the Hall of Technology. It is to house displays selected to give visitors an insight of the application of pure and applied science in the UK. The British Industries Pavilion which is intended for the remainder of the UK display will provide* 100,000 *sq. ft. of exhibition space.*

Melting Facilities get Priority

International Combustion, Limited, continue a series of developments by mechanizing cupola charging and installing a 5-ton mains-frequency electric furnace.

Generally speaking, "tied" foundries—that is, foundries which exist solely to serve the needs of a company's machine-shops, construction and assembly shops—are the "cinderellas" of the foundry industry. Somehow, if there is money available for re-equipping such a concern, the foundry is usually the last department to benefit and one often hears it said of the castings produced that "they could be bought cheaper outside." So much has this become the accepted state of affairs, that it gives real pleasure to visit the foundry of International Combustion, Limited, at Derby, where the reverse is true, despite the fact that this large foundry only supplies the needs of the firm's engineering shops. The size of the foundry (56,250 sq. ft.) and its weekly tonnage (over 200) indicates that the hunger of the rest of the works is truly ravenous; to show that it supplies the appetite of the gourmet *as well as the* gourmand *is a purpose of this article. In this foundry, one enlightened development has followed another ever since its inauguration. Two of these—cupola charging and a normal-frequency electric furnace installation—are the main items dealt with in this present account, but it would fail in its purpose if it did not also convey to the reader the continuous nature of improvement at the foundry, and hint at other—and quite as important—projects of the future.*

CUPOLA CHARGING

Historical

When the foundry of International Combustion, Limited, was built in November 1922, and right up to the closing stages of the war period, shortages of labour were almost non-existent. Though working conditions in some departments were not ideal, labour was always available to fill these positions and grouped under this category came cupola charging. As demand and output increased, more men were employed and at one time, prior to mechanical charging of the furnaces, quite a large number of men was required for this purpose. Immediately after the war period, however, attracted doubtless by other branches of engineering which offered better working conditions and higher wages, the labour force drifted away from the foundry.

In the early days, when all moulding was done on the floor, one hand-charged cupola of 10-tons per hour capacity was sufficient to handle an output of between 40 and 50 tons of finished castings per week. Pig, coke and limestone came in by rail and were dumped into any space available adjacent to the cupola. Barrows were then filled and the material conveyed by an electric lift to the charging platform, to be stored by the side of the cupola in readiness for the afternoon "blow." Later, as production steadily increased, a second 10-ton cupola was installed and by using alternate cupolas, repairs could be carried out without affecting the output.

Foundry Expansion

By 1934, the output of castings was being limited by having insufficient quantities of hot metal for

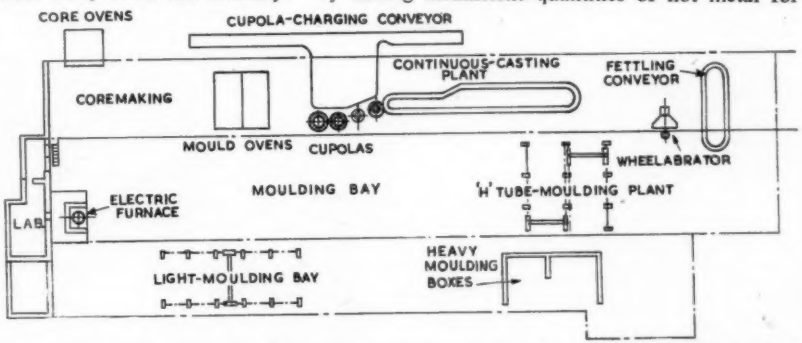


FIG. 1.—*Plan of the general layout of the Derby foundry of International Combustion, Limited, showing the cupolas and electric furnace in relation to the other major sections.*

The position became serious and the output was jeopardized as a result of there being insufficient labour for furnace charging. Steps were taken to utilize the available labour force to the best advantage and, by installing what is in some respects a unique charging plant, output has not only been maintained but increased, yet with an ultimate reduction in manpower.

supplying the expanding and partly mechanized foundry and it was decided to instal more cupolas, which were then thought to be adequate to meet the increasing output. One of the existing 10-ton cupolas was removed and replaced by two 3-ton cupolas, which were to be used all day (on alternate days) for supplying metal to a new continuous casting plant which had been installed. In addition,

FIG. 2.—*Hot-metal tipping receiver serving the cupolas; note the monorail-suspended hand ladle used to pour moulds on the adjacent mechanized moulding unit.*

a 6-ton cupola was sited between the new cupolas and the remaining 10-ton furnace, the former being used once a week for special iron and the latter every afternoon.

By 1947, with two cupolas operating daily, the weekly output had increased to 150 tons, but again production was being limited, this time by the shortage of labour. Men who were employed to charge the cupolas either worked in the open, and were exposed to the elements, or perspired from the heat of the cupolas, with the result that they were leaving to find better working conditions elsewhere. Labour problems became serious and it was evident that if production were to increase, the existing method of hand charging would have to be superseded by mechanical operation.

Although the existing cupolas were not ideally situated for mechanical charging (see Fig. 1), the difficulties of setting up the melting plant on a more suitable site involved extensive alterations and the financial prospect resulted in retaining them in their original positions, but with certain modifications. Several schemes were envisaged with a view to improving working conditions, saving manpower, charging mechanically and finally, increasing output. The year 1948 saw the first of these developments, namely, alterations to the existing two 3-ton cupolas. These were increased to 6-tons per hour capacity and at the same time the pouring spouts were raised. The further necessity for the cupolas to deliver metal into a hot-metal receiver (Fig. 2) involved raising the charging-platform roof an additional ten feet, to accommodate also the future mechanical charger. At that time, the cupolas continued to be hand charged, but a 5-tons capacity travelling overhead electric-crane, fitted with a 30-in. magnet for lifting the material from the stockyard to the charging platform, replaced the existing lift; saving considerable time and manpower.

Charging Conveyor

Next, in 1951, work began on the mechanization of cupola charging and the then existing methods of charging, such as skip and magnet, were abandoned owing to the limitations of the space available and the difficulties in charging all four cupolas efficiently. Thoughts were turned to an overhead chain-conveyor, carrying weigh buckets (Fig. 3). This scheme, though not conventional, well adapted itself to the site conditions and on this design, the present cupola charging plant was developed.

Having re-organized the stockyard, a row of duplex stock-bins, each being allotted its own material, now runs between the railway line and parallel to the foundry wall; these are filled with pig or scrap direct from rail wagons or stockyard by the overhead crane. The endless overhead chain-conveyor (Figs. 3 to 8) was then installed; of nominal loading 11 tons and of Crescent-Webb manufacture, it carries 22 buckets, each having a scale weigher and appropriately marked for the type of charge. The conveyor travels along the row of stock bins (Fig. 4), rises a total of 30-ft. up by the side of the foundry into the charging bay, the floor of which is 19 ft. above ground, and passes along in front of the cupolas, 3 ft. 6 in. above the charging-cill level. It then leaves the bay and runs down the side of the foundry passing over a device at floor level (Fig. 8) which automatically closes the bottom doors of the weigh hoppers, thus completing the circuit.

Method of Operation

The capacity of the conveyor is 22 tons per hour; it travels at 14-ft. per min. and is driven by two Crescent-Webb floating caterpillar-drives, one positioned at the bottom and having a 4-h.p. motor and the other, with an 8-h.p. motor, located

at the highest point. As the conveyor passes along the stock bins, the loaders, who are now able to work under cover, can readily fill the buckets and simultaneously keep check of the weight of the charge. Mounted on the charging platform in front of each cupola is a charging machine (Figs. 5 to 7) consisting of a short cone-shaped chute and a charge bucket of the same capacity as the weigh bucket which traverses into the cupola at the end of a pneumatic ram having a 6-ft. stroke. The single operator on the charging platform stands at a remote-control panel, so positioned to give him a clear view of all the cupolas, and as the filled buckets pass along in front of the cupolas, he selects the one required and by means of a pneumatically-operated cam, opens the doors of the weigh bucket (Fig. 6) to drop the charge into the appropriate charging bucket. This is then traversed into the cupola and discharged as required (Fig. 7). The empty charging bucket returns automatically ready for receiving the next charge.

Present-day Conditions

The net result is that to-day, with three loaders and an operator in attendance, not only has the cupola charging plant kept pace with production, but results show, with an output of over 200 tons per week, that it will be capable to meet any requirements for increasing output up to 50 per cent. without the need for extra staff. Five years of successful operation, with low maintenance costs, has well proved the efficiency of the system. It remains extendible to serve extra cupolas if required, with but moderate structural change.

In 1954, with the ever increasing cost of coke, the two 6-tons per hour cupolas were converted from cold to hot blast, using a somewhat modified version of the well-known Schack recuperator. Water-cooling segments (Fig. 9) were also built into the system. (An article describing the conversion was published in the January 5, 1956, issue of this JOURNAL, by Mr. R. Burleigh, M.Inst.F., a director of the firm). It is noteworthy that after 3 years' operation for nine-hour periods on alternate days, no re-bricking of these two water-cooled cupolas has been necessary. The extension (forecast in Mr. Burleigh's account) of water-cooling to the top brickwork and steelwork at the gas take-off point of the cupolas has recently been effected, with consequent reduction of distortion at these areas.

Additional Details

The stock bins serving the weigh buckets of the cupola charger at ground level have an approximate total capacity of 50 tons. Those containing foundry return scrap are automatically replenished from tip-up pendulum buckets which alternate with castings buckets on a pendulum-type cooling-conveyor circuit that runs outside the foundry adjacent to the bins. The main stockyard is spanned by an electric overhead travelling crane of 5 tons capacity, carried on a gantry 68-ft. wide and 550-ft. long. The charging stock bins, eight in number, are constructed of steel-capped (used) wooden railway-

FIG. 3.—*One of the 22 weigh buckets incorporated in the chain-conveyor system. Both bucket and weigher (12-cwt. capacity, tare 12½ cwt.) are of domestic design and manufacture.*

FIG. 4.—*First stage in the charging sequence—buckets being loaded at the pig-iron and scrap benches. Note that the latter are at a convenient height to obviate direct lifting and that the operators work under cover. The raw-material bins have their bases sloping down to the cill and at the rear of each is a separate compartment in which is kept a reserve stock.*

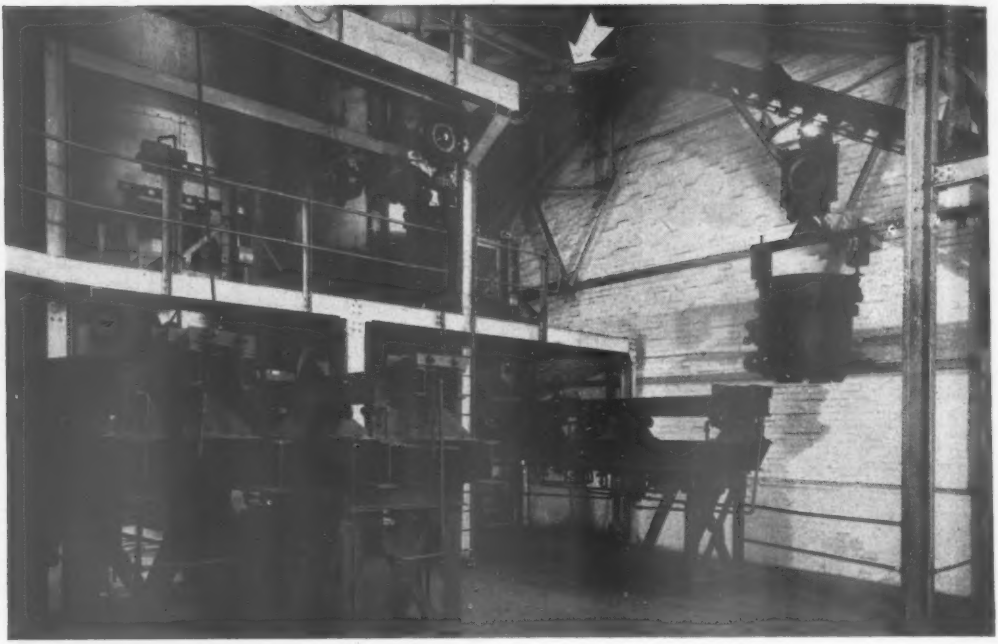


FIG. 5.—*Charging platform, showing the chain conveyor and buckets serving the hot-blast cupolas. At each furnace, selected buckets can be discharged automatically into a secondary hopper, which is later pushed into the furnace to deliver its complete charge. Rear views of the three pusher mechanisms are shown in the lower left and centre of the illustration; one of the special corner conveyor idlers is arrowed (top, right).*

sleepers and have a steel-lined base, also of sleepers, sloping to the delivery cill. A reserve stock is accommodated at the rear of each, a provision which serves as a "buffer" in the event of a crane or magnet breakdown. Similarly, in any emergency —posed, for example, by failure of the charging conveyor—hand charging could be practised from the platform, where sufficient free space has been retained to accommodate this eventuality. As a further proviso, automatic stops are set into the runway joists to prevent loaded buckets from running back in a case of chain breakage, at the same time as power is automatically cut off from the drive units.

Initially, excessive wear of some of the chain links took place at the sharp bends, where lateral loading was high. This was obviated by designing and installing idler-chain loops at these points, as shown (arrowed) in Fig. 5. These corner cap "caterpillars," as they are called, located at the point of upward grade prevent undue loading of the chain links, they incorporate a self-revolving chain-type bend which takes up side-pull at the point of change in direction—a load which cannot be accepted by straight rollers because of the excessive wear which occurs.

For the smaller cupolas, all the charge, including coke and limestone, is contained in one bucket but, for the 10-tons per hour furnaces, three buckets are used for each charge, *viz*: one for coke and limestone, the second for pig and the third for scrap.

Pusher Mechanism

The mechanism used for the emptying of a charge bucket into a cupola by means of the pusher, shown in Figs. 5 and 7, perhaps needs further elaboration. At rest, the bucket is supported on two rear wheels and two small central rollers, located on a tapered anvil to cushion the drop of the load. The front half of the door is closed by a balance weight. On entering the furnace shaft, after operation of the ram, the rear-door rollers pass over steeply declining cast-iron brick which releases the bucket's load. On withdrawal, the balance weight closes one half-door while the other half is closed by its rollers returning to the original position. A further safety device is incorporated to prevent a second weigh-bucket being discharged while the contents of another are already being delivered into the furnace.

INDUCTION FURNACE

Now in operation at International Combustion's Derby foundry is Britain's first production-size mains-frequency coreless induction melting furnace. The 300-kw., 5-ton capacity unit, shown in Figs. 10 and 11, was manufactured and

installed by Birlec, Limited, Birmingham, who have been carrying out development work on this type of furnace for several years. In 1955, this company installed an experimental unit at the Coventry foundry of the British Piston Ring Company, Limited. This (which was later used also for trials at the Derby foundry) proved successful when melting a wide range of ferrous and non-ferrous metals, and gave valuable experience of operating the pilot plant under actual works conditions.

The principle of the mains-frequency coreless induction furnace is similar to that of the high-frequency unit. The melting chamber or crucible, cylindrical in shape and lined with a rammed refractory, is surrounded by a helical water-cooled copper coil, through which a heavy current is passed to induce the necessary heat in the charge. The furnace can be considered as a simple transformer with the charge forming the secondary coil. The main difference between the mains-frequency furnace and the high-frequency unit is that it has now been found practicable in furnaces of capacities larger than about 15 cwt. to supply the coil with current at 50 cycles instead of at frequencies between 1,000 and 10,000 cycles, with considerable savings in running costs.

Another reason for the present-day tendency to recommend main-frequency induction units is based on the realization that given a " heel " of sufficient mass of metal in the furnace, heating at this comparatively low frequency becomes feasible—both electrically and economically speaking. In fact, the electricity/heat conversion efficiency of the mains-frequency unit of this size is reported to be about the same for ferrous-metal melting as the arc furnace, but for a given size of furnace-body a much greater input can be arranged for the arc type.

The mains-frequency unit can undertake a wide variety of melting jobs with both ferrous and non-ferrous metals, including: cast-iron—remelting borings; steel—swarf reclamation; aluminium—reclaiming swarf and trimmings; bronzes and brass—melting and swarf reclamation. The sizes of the furnaces on order vary from 12 cwt. to two units of 15 tons which will be amongst the largest induction melting-furnaces in the world. In all, Birlec report that orders for 20 furnaces of this type have been placed with them.

Applications at Derby

The installation at International Combustion will be concerned mainly with spheroidal-graphite cast-iron to be used in place of steel castings and complicated steel-forgings which at present form components of pulverizing mills, powdered-fuel burners, coal feeders, travelling-grate stokers, spreader stokers and various components of grinding, screening and filtering plants. Spheroidal-graphite cast-iron has already been used for prototype castings such as mill roller arms, stoker

FIG. 6.—*Bucket tripped by means of its side mechanism to empty its contents into a chute leading to the charge hopper. This operation is initiated by an operator at the platform controls.*

FIG. 7.—*Charge hopper being pushed into the furnace; note how the front bogie wheels run over the lip to release the bottom and so discharge the contents. All the discharge mechanism is sequence controlled.*

FIG. 8.—*After returning to ground level, the doors of the weigh hoppers are closed and locked automatically by the skid mechanism illustrated. Any buckets which reach this point while still containing their charge pass this device unaffected and continue passing around the conveyor loop.*

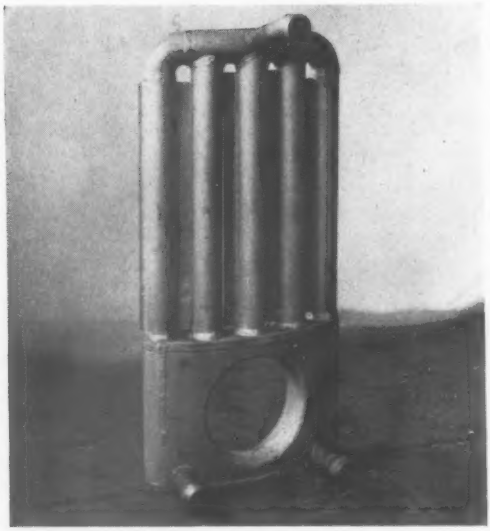


FIG. 9.—*One of six water-cooling segments inserted into the melting zone of each of the hot-blast cupolas as International Combustion, Limited. These also are designed and constructed at the Derby works.*

driving gearbox-worms, gearwheels of various sizes, grinding rolls and similar parts. The results, both from the point of view of production and also of prolonged wearing life, are promising and it is proposed to extend the application of this ductile iron to include every component where the form indicates a casting and the function indicates a high-duty metal. The component parts selected for production in this way are already being redesigned to make the fullest use of the new casting technique. Other uses of the furnace will be the production of chrome iron and also stainless steel castings.

Between temperatures of 1,350 and 1,550 deg. C. the superheating rate for the furnace is about 5 tons per hr. per 100 deg. C. with an approximate power consumption of 60 kwh. per ton, and the melting rate is approximately 8 cwt. per hr. with power consumption of 670 kwh. per ton. The latter figure may appear to be high, but this is a large furnace body, primarily designed for superheating and holding hot metal and not for melting. Consequently, the electrical input at 300 kw. is small in relation to the furnace size.

Installation and Design

The installation consists of the furnace (Fig. 10), mounted in a surrounding charging and operating platform that also carries the pouring controls, and a substation (Fig. 11), immediately behind the platform, for the electrical equipment. At the rear end above the furnace is the foundry laboratory (Fig. 12), so situated that the furnace can be viewed in action at all times and samples can be analysed without delay.

The induction coil is wound of a specially shaped section in high-conductivity copper. It is designed for maximum electrical-efficiency, safety in the event of a metal break-through and free passage for the necessary cooling water. The coil is supported and restrained axially by spring-loaded end-rings, and radially by packets of transformer iron which also constrain the magnetic flux and permit the use of a solidly welded steel outer casing.

The furnace itself imposes virtually no maximum temperature limitation, only the limit imposed by the lining material chosen need be

FIG. 10.—*Mrs. J. Mayer (wife of the joint managing director, of International Combustion, Limited) operating the controls of the new induction furnace at its formal inauguration.*

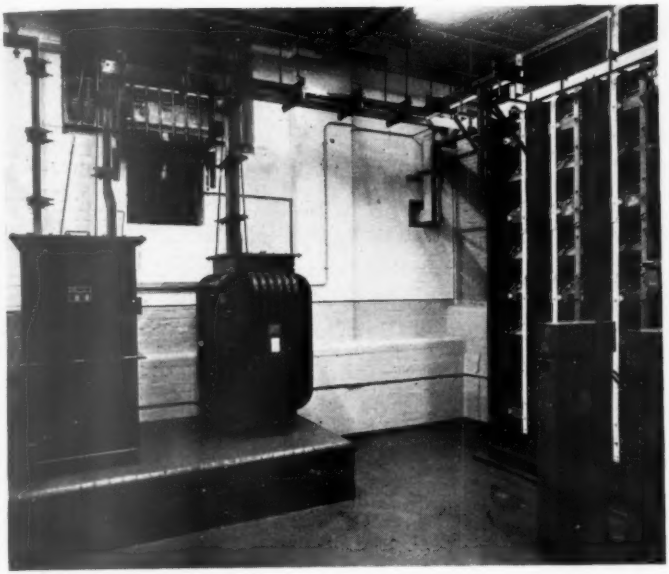


FIG. 11.—*Electricity sub-station for the 5-ton mains-frequency furnace. On the left are the reactor and transformer; above these are the water-control cubicle and the back of the furnace control-panel. The furnace and capacitator banks are on the right-hand side and the bus-bar connections through the wall to the furnace can also be seen (right, centre).*

considered. The first lining of the present furnace is of a high-silica material rammed round a sheet-steel former that is melted out with the first charge, thereby sintering the lining.

Lining Life

The life of the lining of a mains-frequency coreless furnace has been found in practice to be satisfactory up to very high temperatures. When melting iron it is normally about 150 heats where a pouring temperature nearing 1,500 deg. C. is used.

For steel, any number between 30 and 150 heats may be expected from one lining, depending on the temperature, type of material used, and the care with which repairs are carried out. For light alloys, the lining life is indefinite—on the Continent, where these furnaces are very popular, not one furnace employed on light metals has been taken out of operation owing to a breakdown of the lining.

The UK furnace is tilted for pouring by hydraulic rams, one on each side of the body. These are supplied with fluid by a vane-type pump controlled by a valve mounted on the control-stand on the furnace platform. The present installation runs off a low-tension supply of about 420-v., which is fed to the equipment through a contactor and an isolator that is mechanically interlocked with the substation access-door and with the entrance to the furnace excavation. (As preliminary and production tests on the 5-ton unit at Derby are completed over the next few months, it is expected that performance figures for the plant will be made available to readers of this JOURNAL.)

Birlec, Limited, has an agreement with Otto Junker GmbH of Lammersdorf, Germany, and the Ajax Engineering Corporation, of America, for the development and marketing of this type of equipment, which has been pioneered over a number of years by the Junker concern.

OTHER DEVELOPMENTS

A number of other interesting developments are proceeding at the International Combustion foundry, some of them directly related to the company's participation in atomic-energy commitments. The foundry is specially noteworthy for the

FIG. 12.—*Part of the newly-erected "stage" laboratory serving the foundry and particularly the electric furnace—above and behind which the laboratory is situated.*

FIG. 13.—*Centre bay of the foundry; a large casting, moulded in loam, is being poured. Smaller moulds are floor "banked" (left, foreground).*

versatility of its production, manufacture of both very large and very small components proceeding within a few yards of each other (Fig. 13) and yet flow-production methods have been well applied in each case. Already this method of production, along with the reduction in handling of components, has been applied in quite a unique fashion for the fettling of small and medium-weight components. Here, as shown in Fig. 14, a motorized pallet-conveyor loop takes castings to and from the men engaged in dressing and grinding operations. (Yet a further installation now proceeding at the foundry involves new Hydroblast plant about which it is hoped to inform readers in the not-too-distant future.)

FIG. 14.—*Part of the motorized-pallet conveyor loop, 110 ft. long, serving the fettlers. as far as possible, storage of castings on the floor of the shop is avoided "like the plague."*

Acknowledgments

The writer gratefully acknowledges permission from the directors of International Combustion, Limited, to publish these accounts and illustrations. In particular, special thanks are accorded to Mr. Burleigh and his colleagues who have made notes, drawings and photographs freely available. The assistance of Birlec, Limited, is also gratefully recorded.

Titanium-bearing Steel Record

By careful advance planning, close timing, and temperature control, a 65-ton cast of titanium-bearing steel was tapped successfully from the large arc furnace at the works of Samuel Fox & Company, Limited, a subsidiary of the United Steel Companies, Limited, at the end of last month. This was twice the quantity of this steel ever produced before by a single furnace in this country. Titanium-bearing stainless steel is one of the most difficult types of stainless to produce in an arc furnace to very low carbon specifications.

Board Changes

EXPANDITE (SOUTH AFRICA) (PTY.), LIMITED—Mr. R. E. Harris, resident sales manager for the past three years, has been appointed to the board.

LAPORTE TITANIUM, LIMITED—Owing to increasing responsibilities within the Laporte group, Mr. P. D. O'Brien and Mr. B. E. A. Vigers have decided to resign their positions as joint managing directors. They remain chairman and vice-chairman, respectively. Mr. W. Woodhall, a director and general manager of the company, has been appointed managing director.

Association of Bronze & Brass Founders

General and Annual Meetings held in London, April 4

A general meeting and the annual meeting of the Association of Bronze & Brass Founders were held at the Connaught Rooms, London, on Thursday of last week, attended by upwards of forty delegates of member firms. Mr. W. T. Hobkirk, J.P., C.C., occupied the chair at the commencement of the proceedings.

After apologies for absence and the minutes of the general meeting held on April 25, 1956, and of the special general meeting held on November 27, 1956, had been confirmed (with slight amendments) the following firms were formally admitted to membership: C. & A. Stewart Limited (Glasgow); Harvey & Longstaffe Limited (Manchester) and Hilger & Watts Limited (London). The resignation of Mather & Platt Limited (Manchester) was recorded.

PRESIDENT'S REPORT

Next Mr. Hobkirk, as president of the Association for the session completed, gave his report on the activities in the following terms:—

Conditional Aid

This service nominally finished at the end of September last and all members have been sent a copy of the final report on this matter which was sent to the Board of Trade. There is, however, quite a lot of work still going on, such as the costing book and the metal-melting report. The effect of the effort put into the service is continuing, however, and will be permanent; by it the ABBF reputation is enhanced and many firms, both members and non-members, have been helped and stimulated. Copies of the conditional aid reports have gone all over the world and the relationship with the British Non-Ferrous Metals Research Association has taken on a new and more fruitful meaning, which it is hoped will become bigger and better. All this has only been achieved as a result of the way members and individuals have devoted themselves, their resources and talents to the common good. The Association is not unique in this, but it is, nevertheless, a remarkable and heartening thing, and it is perhaps the answer to those firms who hesitate to join, asking "What do I get out of it?"; perhaps one should ask them "What can you put in?" Once they are in they will say the same as present members, namely, "I get out of it more than I put in!" In undertaking the Advisory Service the ABBF knew they would be faced with great difficulties and hearty thanks are due to those who have ensured its successes.

Continuance of the Advisory Service

Having achieved success in the Conditional Aid Advisory Service, it is the Association's intention to continue to give similar services which will now, of course, be confined to its own members. Some of the aid will no doubt involve the services of the Research Association and if the publication of reports is to be continued, funds will be required. Members who are not already in the research, advisory and technical-aid group are therefore invited to consider joining it. If they will make full use of the facilities available, it will be to their own advantage and help forward the industry.

Safety, Health and Welfare

As members know, the Association has been playing an important part in the work being done by H.M. Inspector of Factories' Advisory Committee to revise the regulations governing non-ferrous foundries. Significant progress has been made and new draft regulations will, it is expected, soon be available for comment. Mr. G. T. Hyslop who was the main representative on the Committee has now had to resign but during the years he has served in this capacity he has put in a great deal of work—and very valuable work—for which the Association and the non-ferrous foundry industry in general are deeply indebted. Whatever foundries may have been in the past, the new and modernized plants are evidence that in future the foundry will be a good place to work in.

Exhibitions

The Association had a stand at the Sheffield and District Foundry Exhibition held last November, and all who saw it spoke of its success. The whole of the arrangements on the Association's behalf were made by Mr. Ayres who also arranged to staff and supervise the ABBF stand; his energy and enthusiasm are indeed a great asset to the Association. The British Productivity Council has been greatly impressed by the work which was done under the Conditional Aid Advisory Service Scheme as they were by the ABBF conference held in Harrogate in 1952. It is part of their duty to spread productivity knowledge and to this end they are urging that the Association should hold a further conference and this has received consideration by an ABBF sub-committee (of which more later).

Restrictive Trade Practices Act, 1956.

As members are aware, the position of the Association in respect of this Act, was considered at a special general meeting held on November 27 last, and in accordance with the decisions taken, the Association's "Recommended Conditions of Sale" have been registered. It is essential for any industry that there should be generally accepted conditions of sale and the Association's which embody the custom of the trade over many years, have been of great help to members.

European Free-trade Zone

The intention of the Government for the United Kingdom to participate in the European Free-trade Zone must have very important consequences for

Association of Bronze & Brass Founders

all British industry. How this will effect brass and bronze founding is being studied by the ABBF Council and in due course there is no doubt that their views will be made known to the Board of Trade.

Accounts

Members will note with satisfaction that after providing for taxation there is a fair excess of income over expenditure—this has been brought about through an increase in contributions received from members, without a corresponding increase in expenditure. In face of the current inflation this is a very satisfactory result, and will enable a transfer to be made from the "common-fund" account to the guarantee-fund account, partially restoring the latter to its original amount.

Membership

It gives the greatest satisfaction that during this year membership of the Association has again increased. The efforts of the Association should have the support of all bronze founders in the country and their membership will be welcome.

In conclusion the president voiced his thanks to fellow officers, members of Council, the technical committee and the staunch body of members for their support, also for the help of the section officials.

TECHNICAL REPORT

The next item on the agenda was the report of the Technical Committee presented by the chairman, Mr. R. Lancaster (J. Stone & Company, Limited) in the following terms:—

The Technical Committee has met on four occasions during the past year and a great deal of its time has been devoted to matters arising from the revision of B.S.1400. Apart from this, a subcommittee has met on four occasions to draft a "companion volume" to the new British Standard B.S.1400, to be available when this is published.

B.S.1400 Revision

Each specification to be included in the new standard B.S.1400 has been carefully examined individually to ensure that it is satisfactory in all aspects, and all particulars of the resultant specifications proposed were sent to members last August. When the revision of the standard became due, all members were asked for their views on the matter and replies were carefully considered by the committee and used for guidance. From time to time members were circularized on particular points of difficulty to find out how widely shared were the apprehensions expressed on these points by some members. All replies received were used to supplement or modify the knowledge already at the disposal of the Technical Committee, but it is to be regretted that so few members wrote in reply for information, particularly as the new standard is of such vital importance to the industry. The Committee earnestly requests members to co-operate as much as possible in any future requests for information, so that this new standard will be truly representative of the best opinions of the industry.

To summarize the amendments proposed: The specifications are set out with the main constituents in heavy type and optional constituents in normal type all of which have to be determined analytically. It was originally proposed to specify limits for seven impurities namely, antimony, arsenic, iron, sulphur, silicon, aluminium and bismuth, but owing to the lack of technical information on the effect of many of these impurities, it was decided to set a limit only for silicon, iron and aluminium, until such information was available regarding the other impurities.

There is a need for a great deal of work to be done on the effect of impurities such as antimony, arsenic and sulphur on the bronzes (incidentally, BNFMRA has already done some work on this), and it is hoped to be possible for the appropriate bodies to carry out this work in the not-too-distant future. The limits for silicon, aluminium and iron have been set at reasonable values, which will safeguard the quality of the metal without affecting the economics of its production.

As regards mechanical properties, ultimate tensile stress has been replaced by tensile strength and, in many cases, the standards have been raised. In general, the Committee is satisfied that the new limits can be reasonably attained with metal of the correct chemical composition whereas the levels with the old specification do not reflect the true capabilities of the metal and can, in fact, be obtained with metal of inferior composition.

Casting of Test-bars

To assist members who may have experienced difficulties in attaining satisfactory properties in their test-bars, information has been circulated setting out methods of casting test-bars which have been found to give satisfactory results, and it is hoped that further information on the subject will be available in the near future from investigations which are now taking place. In the special case of aluminium-bronze sand castings, members are specially asked to inform the Committee of the results which they attain using the methods advocated.

"Companion Volume"

All that can be said about this at the present time is that a great deal of work and thought has been put into drafting the various sections which are almost complete. The work will then be ready for the final editing and will only require to be brought into line with any additions or amendments to the new British Standard. The information which the volume will contain will be of very great help to all users of bronze and brass castings and in particular it is hoped that it will be a useful guide to designers.

Code of Inspection-procedure

This Code, which has been in operation for some 2½ years, has, it is believed, proved very satisfactory in service (in fact another foundry association is

now negotiating for a similar code). There will, however, be an opportunity of reviewing it (in early May) along with representatives of the various inspectorates and any points which members may wish to bring forward will be given attention.

Other Bodies

The Association has representatives on the appropriate committees of the Institute of British Foundrymen in whose work the ABBF is very pleased to participate to mutual benefit. With the advent of the Advisory Service under Conditional Aid, ABBF liaison with the British Non-Ferrous Metals Research Association has become closer than ever, and it is hoped that more and more members will realize the advantages to be gained by membership of the research group—aiming ultimately at 100 per cent. membership.

A.F.S. Congress 1957

The Association has been very pleased to accept an invitation from the American Foundrymen's Society to prepare a paper for their congress this year and one has been prepared by Mr. E. C. Mantle in co-operation with the ABBF Technical Committee. It is entitled "Co-operation for Technical Advancement in the British Bronze and Brass Foundry Industry" and in it an attempt is made to show the American industry the amount of voluntary co-operation in technical matters which exists in this country for the good of the whole industry.

Committee Membership

During the year the Committee lost the services of Mr. D. H. Potts owing to pressure of work, but was pleased to welcome Mr. J. A. Duncan as the representative of Westinghouse Brake & Signal Company Limited, in his place.

In concluding, the Chairman thanked the other members of the Committee for their loyal support during the year, and also those members who served on the sub-committee for the drafting of the "companion volume," and who had done a strenuous job in writing up the various sections of this book. The secretaries, too, had done a very good job in reporting the work, and in this respect, he thanked Mr. Rogers for the great help he had personally accorded.

When discussion was invited on this report, one member reported difficulty in meeting the tensile strength requirements of the AB_2 aluminium-bronze alloy, and immediately there were further offers of co-operation from other members in this respect.

Other Business

At this stage, the secretaries outlined the progress made with the "Melting Report" and the "Costing Manual," both of which will be available shortly, prices being of the order of 10s. (non-members £1) for the former and 15s. per set or 10s. each (£1 1s. per set to non-members) for the latter. Much of the work on these books has been extra to that convened by Conditional Aid.

The proposed conference of the Association in the Autumn of 1957 was then referred to, but members were almost unanimous in the decision that the time was not propitious for any such function.

ANNUAL MEETING

Following the general meeting, the fourteenth annual meeting of the Association was held. After Apologies and Minutes had been disposed of and the audited accounts approved, election of officers for the coming session was proceeded with, the results being: As president Mr. P. B. Higgins (Yorkshire Engineering Supplies, Limited); (at this point, Mr. Higgins took the chair for the rest of the meeting, being invested with the badge of office by Mr. Hobkirk). Mr. A. J. N. Brown (Steven & Struthers, Limited) was elected vice-president, and as trustees Mr. W. S. Lawson and Mr. G. T. Hyslop and Mr. L. H. Cleaver. The four retiring members of Council—Mr. E. J. Brooke, Mr. A. J. N. Brown, Mr. P. B. Higgins and Mr. W. R. Marsland—were all re-elected as was the whole of the Technical Committee, the publicity committee and the cost committee, *en bloc*. Mr. W. R. Buxton was re-appointed Editor of the Association's *Bulletin*, and warmly congratulated on his excellent work in this connection.

Dealing with ABBF representatives on other bodies, appointments of existing personnel were confirmed, excepting in the case of the Ministry of Labour and National Service Joint Standing Committee on conditions of safety, health and welfare in non-ferrous foundries. Here, the resignation of Mr. G. T. Hyslop was accepted with some regret for he had been a most assiduous member; Mr. E. Ayres was elected as his alternate, and it was unanimously agreed to send a formal letter of thanks to Mr. Hyslop for his invaluable work in this field.

Kemp Chatteris & Company, chartered accountants, were re-appointed auditors and Heathcote & Coleman as secretaries, the latter on a proposition from Mr. Hobkirk coupled with a warm endorsement from members for the appreciation he expressed for their services. During the proposal of a vote of thanks to Mr. Hobkirk, the retiring president, Mr. Higgins pinned on his past-president's jewel, which the recipient said would always remind him of the honour done him in being president over two of the nicest years of his business life.

(This concluded the meeting.)

Social Evening

As a prelude to the business meetings last Thursday, the previous evening members spent in social functions to which the ladies were invited. About 100 participated; first, there was a cocktail party at the Grosvenor House Hotel, Park Lane, after which the assembly went by coach to Aldwych to see a performance at the Duchess Theatre. On return to Grosvenor House, dinner was followed by dancing until 1.30 a.m. The informal atmosphere was conducive to friendly meetings of members from distant parts of the country and the organizers are to be congratulated in providing just the right setting for this initial get-together.

Birmingham College of Technology

Associateship Presentation Ceremony

On March 30 the annual associateship presentation ceremony of the Birmingham College of Technology was held in the Town Hall, Birmingham and following it, a luncheon was held in the new college at Gosta Green. The College principal, Dr. P. F. R. Venables, PH.D., B.SC., F.R.I.C., referred to the designation of the College as one of the advanced technical colleges under the new scheme announced recently by the Government—the first to be so described. The constitution of the College has now been widened to cater for all needs and Dr. Venables referred to the importance of the scheme for the award of the qualification of Dip.Tech. He also stressed the importance of the "sandwich" and post-graduate courses which will be available and thanked industry as a whole for their increasing support.

At the ceremony, diplomas of associateship were presented to qualifying students by the heads of the various departments of the College, and in metallurgy 15 students received their diplomas from Dr. I. G. Slater, PH.D., M.SC., F.I.M., C.I.MECH.E.

Honorary associateships were later presented to:—The Rt. Hon. Lord Hives, C.H., M.B.E., D.SC., LL.D.; W. Byng Kendrick, Esq., B.A.; Sir Harry Pilkington; Sir Harry Railing, D.ENG., M.I.E.E.; Mrs. Winifred Raphael, B.SC.; Victor Emmanuel Yarsley, Esq., D.SC., F.P.I., F.R.I.C., M.I.CHEM.E. and Henry John Cull, Esq., M.B.E., A.R.C.S., D.I.C., A.INST.P. Speaking on their behalf Lord Hives said that he was convinced that the UK would be able to supply the increasing numbers of technologists required in industry, through the medium of the technical colleges. Being in a major centre of industry, it was only right that Birmingham should have the senior technical college, already extensions to the new college buildings were being carried out.

Referring to the new award of Dip.Tech,. Lord Hives said that he believed that it would take its place by the side of university degrees; it should not be forgotten that there were still many young people who preferred to "earn as they learn," and also many who were not able to afford to go to university, even with the help of grants. However, students should "learn in depth as well as in breadth." The humanities were still important even to the technologist and a good command of the English language was essential, as a technologist should be able to express himself adequately in order to disseminate the results of the work being carried out.

At the luncheon which followed the presentation ceremony, the speakers were J. J. Gracie, C.B.E., HON. A.C.T. (BIRM.), M.I.E.E., F.I.I.A. (chairman of the Governing Body of the College of Technology and a director of the General Electric Company Limited), the Deputy Mayor of Birmingham, Ald. A. L. Gibson, J.P., and Sir Harry Pilkington (chairman, Pilkington Bros., Limited).

FOLLOWING THE SUCCESS of two previous similar conferences, the United Steel Companies, Limited, are once again holding a week-end residential course at Cambridge for 110 apprentices and junior operatives on the theme of "responsibility." During their stay in Downing College from April 12 to 15, they will hear talks given by leading industrial and educational authorities and will take part in a number of discussion groups.

Institute of Metals

Spring Meeting

The 1957 Spring Meeting of the Institute of Metals, to be held in London from Monday to Friday, April 29 to May 3, will be a joint meeting with the *Associazione Italiana di Metallurgia*, the *Association Suisse pour l'Essai des Matériaux*, and the *Société Suisse des Constructeurs de Machines*. Members of the Iron and Steel Institute are also being invited to take part. There will be an extension of the meeting for the members of the Italian and Swiss societies from Saturday to Wednesday, May 4 to 8, when works in the provinces will be visited. Details of the part of the programme which has interest for foundrymen are given below.

At 9.30 a.m., Wednesday, May 1, there is to be a symposium on "Metallurgical Aspects of the Control of Quality in Non-ferrous Castings" when the following papers will be presented and discussed:—(*a*) Ruddle and Cibula: "Metallurgical Principles of the Control of Quality of Non-ferrous Castings"; (*b*) Martin: "Rôle of Statistical Methods in Controlling the Quality of Non-ferrous Castings"; (*c*) Carless: "Metallurgical Control of Quality in the Production of Aluminium-alloy Castings"; (*d*) French: "Metallurgical Control of Quality in the Production of Copper-base-alloy Castings"; (*e*) Emley and Fisher: "Control of Quality of Magnesium-base-alloy Castings"; (*f*) Wood and Gregg: "Control of Quality in the Production of Nickel-alloy Sand Castings"; (*g*) Sharp: "Control of Quality in Pressure-die-castings"; and (*h*) Fry: "Non-destructive Testing in the Control of Quality of Non-ferrous Castings." This meeting will take place in the Hoare Memorial Hall, Church House, Westminster, London, S.W.1. At the same time and the same place there will be a session devoted to the metallurgy of niobium. In the afternoon the symposium will continue at 2.30 p.m.

On Thursday, May 2, all-day visits for the members and ladies of the Italian and Swiss societies have been arranged, commencing at 9.30 a.m., from Tufton Street, London, S.W.1. For both ladies and men there will be a tour of Windsor Castle, St. George's Chapel, Windsor, and Eton College, whilst for the men only visits to the General Electric Company, Limited, Wembley, or the A.P.V. Company, Limited, and A.P.V. Paramount, Limited, Crawley, have been organized.

A banquet and dance will be held on the evening of May 2, in the Great Room of Grosvenor House, Park Lane, London, W.1, when ladies and members of the visiting societies will be guests of the Institute of Metals and those wishing to attend should make early application to the secretary of the Institute at 17, Belgrave Square, London, S.W.1.

Graphite at High Temperatures

Mr. J. F. Lynch, Mr. J. A. Slyth and Mr. W. H. Duckworth in a Battelle Memorial Institute report have described a protective coating they have developed for use with graphite at high temperatures. They have applied molybdenum bisilicate, suspended in a phenolic-resin vehicle, to the graphite surface, followed by curing and then heating in a neutral or reducing atmosphere at from 2,150 to 2,000 deg. C. This procedure resulted in a dense adherent glaze on the graphite which protected it to a significant degree when the material was tested in the form of nozzles in a hot, high-velocity stream of oxidizing gases. The major phase in the material coating is a molybdenum/silicon carbide whilst silicon carbide itself is present as a lesser phase.

Notes from the Branches

Bristol and West of England

Since the last report in the JOURNAL of the activities of the Bristol and West of England branch of the Institute of British Foundrymen, three meetings have been held in addition to the annual dinner. On December 8, members were specially interested to hear a paper on "Investment Casting Techniques," by Mr. P. A. Crooke, for this was the first time the branch had received a paper on this subject. Tracing the development of the process from early times, Mr. Crooke pointed out how little the basic principles of the process had altered in attaining the high standard associated with the applications of to-day. In replies to questions the following points were made :—There was usually little entrapment of air within a mould as this was normally expelled *via* the parting line; the finish of the casting must inevitably be dependent upon the surface of the mould; rigid control must be maintained over the whole process with regard to sieve analyses of sands, wax quality, temperature of ovens, etc.; products usually have to meet A.I.D. requirements; only slight change in volume between liquid and solid was anticipated, and the pre-coating of the wax tended to maintain the strength of the mould.

Mr. D. F. B. Tedds in thanking Mr. Crooke for a most interesting paper said that all members would agree that the process was one which held more difficulties than conventional casting methods. Mr. Birch seconded the vote of thanks, saying that it had given members an insight into a process with which they might not be too familiar.

New Departure

A mid-week meeting, a new departure for the branch, was held on January 15, and 54 members and guests heard a paper on "Modern Aspects of Patternmaking," presented by Mr. B. Levy. During the course of the paper, and again during "question time," Mr. Levy emphasized the following points :—No matter how good moulding practice might be, it was valueless if patterns of poor quality were used, as the quality of the final casting was largely dependent upon the accuracy of the pattern; the use of well-seasoned timber was essential—the value of satisfactory raw materials for patterns could not be overemphasized. On being questioned regarding the repair of patterns, Mr. Levy said that metallizing was often valuable in cases of major overhaul, but old patterns could be reclaimed if sufficient attention was given to detail. To enable the average patternmaker to become more familiar with the requirements of his products, Mr. Levy suggested that it would be advantageous if a certain amount of basic foundry training could be introduced into the patternmaker's training curriculum. Proposing the vote of thanks, Mr. R. W. Drake said the paper had been not only interesting and instructive, but should also have given encouragement to any young patternmakers who were present. Mr. W. J. Hares endorsed these remarks in seconding the vote of thanks.

On February 16, a very successful meeting was held by kind permission of the directors at the works of Newman, Hender & Company, Limited, of Woodchester, near Stroud, Glos. Forty-five members and friends were welcomed on behalf of the company by the branch secretary, prior to hearing a paper on "Mechanization in the Coreshop," by Mr. J. Hill. Points that emerged during the ensuing discussion were:—According to experience in the foundry to which the Author was attached, the use of CO_2 sand for coreblowing was not considered entirely satisfactory since the finish obtained on cores was not always all that could be desired, while the breakdown properties of such cores sometimes gave trouble. Technical control of sand also became difficult where CO_2 sand was used for cores. In all cases, the bottom venting of cores was practised; coreboxes made of wood had not proved satisfactory for coreblowing operations; drying oven-space had to be allocated to ensure maximum efficiency and this sometimes necessitated the allocation of stoves for specific types of cores. Blow-out losses as experienced with coreblowing were slight; blowing heads could often be adapted to cater for two or more cores; the build-up of sand in the blowing head was rarely of appreciable proportions; where clogging of vents occurred, this could often be cleared by means of water boshing.

The vote of thanks was proposed by Mr. C. R. Porter and seconded by Mr. C. Blackburn, both of whom agreed that the paper was an interesting and instructive one and that it presented food for a great deal of thought. After the meeting the members and friends were entertained to tea and many later visited the foundries of Newman, Hender & Company, Limited.

FIG. 1.—*The annual dinner of the Bristol and West of England branch of the IBF was held at the Grand Hotel Bristol on Saturday, March 2. Pictured at this event are (left to right): Mr. H. B. Dauncey (senior vice-president of the branch), Mr. R. B. Templeton, Mr. G. Lambert, Mr. H. J. V. Williams (president of the Institute), Mr. N. P. Newman, Mr. D. P. Williams (branch president), Mr. F. K. Vickery (junior vice-president of the branch) and Mr. G. W. Brown (branch hon. secretary).*

[*Courtesy Western Daily Press, Bristol*]

Notes from the Branches

Annual Dinner

The annual dinner was held on Saturday, March 2, at the Grand Hotel, Bristol, where a representative gathering of members and friends welcomed the national president, Mr. H. J. V. Williams, and Mr. G. Lambert, secretary of the Institute. Other guests were Mr. Rees and Mr. Wall, representing the Wales and Monmouth branch, Mr. W. Snell, representing the Institution of Production Engineers, and Mr. J. Bailey of the Bristol College of Technology. Also at the top table were Mr. N. P. Newman, past-president and hon. treasurer of the Institute, and Mr. R. B. Templeton, also a past-president. The toast of "The Institute of British Foundrymen" was proposed by the senior vice-president of the branch, Mr. H. B. Dauncey, who reminded those present of the Institute's growth and its high standard of achievement. Its members were scattered throughout the world and, through the medium of the technical press and lectures to branches, it had made known to many others the latest and most successful foundry techniques. The National Works Visits had also enabled members in this country to visit and see for themselves, current practice in foundries engaged on differing types of work in given branch areas.

Mr. H. J. V. Williams, replying to the toast, said that the foundry industry had every reason to be proud of the developments of the last 10 years. It was essential for the prosperity of the industry that these developments were appreciated and applied in their respective fields. A noteworthy feature of the activities of the Institute, said Mr. Williams, was the large number of papers made available to its members by those who were so willing to recount their experiences either in the normal meetings or through the medium of the "exchange papers" with allied associations abroad.

Mr. Lambert, in proposing the toast of "The Branch," paid tribute to the work of Mr. G. W. Brown, the branch secretary, whose work was not easy due to the large area covered by the branch, and the fact that members were widely dispersed in groups of varying size within the area.

Mr. D. P. Williams, branch president, replying, said the past year had been a good one in which attendances at meetings had increased, and during which several successful meetings for apprentices had been organized. The enthusiasm of members and apprentices attending the various meetings was something to be proud of, some members travelling 200 miles to attend a meeting. The Bristol branch owed a special debt of gratitude to the speakers who came to present papers; often these gentlemen, too, came from considerable distances, and the branch was grateful to them for the advice and encouragement they gave. Adding his own tribute to the work of the branch secretary, Mr. Williams said that much of this was not always realized by members. He also expressed the thanks of the branch to Mr. L. B. Gabb who has undertaken the work of producing the lecture syllabus for the coming session—a duty which previously had been carried out by the secretary. The toast of "The Visitors and Ladies" was proposed by Mr. F. K. Vickery, junior vice-president of the branch, and responded to by Mr. W. Snell. The evening concluded with an entertainment provided by local artistes.

THE JOURNAL ACKNOWLEDGES with gratitude the receipt of this year's well-known "girl" calendar from Metropolitan Vickers, Limited.

Steel Plate Project

Approval has been received by the South Durham Steel & Iron Company, Limited, for the construction of an entirely new integrated iron and steel works at Greatham (Co. Durham). Announcing that the Iron and Steel Board had sanctioned the project, Mr. B. Chetwynd Talbot, chairman of the company, said that the total estimated cost—£43,000,000—will be spread over five years. The site is that of the West Hartlepool municipal airport.

The acquisition of the airfield was agreed upon when it became apparent that the subsoil of the site previously selected was unsuitable for the erection of heavy plant. The Greatham site will ensure that a fully integrated works can be constructed and that the existing plant plus the proposed developments can be operated as a unit of the highest efficiency.

Work has already begun and it is estimated that, on completion of the new plant, vacancies within West Hartlepool and the neighbourhood will be increased by 2,500 to 3,000. The high level of capital expenditure envisaged, Mr. Chetwynd Talbot states, will in no way influence the policy of increasing the rate of dividend on the existing ordinary capital.

Six Principal Projects

There are six principal projects contained in the plans and it is understood that they will more than double the company's present plate output of about 350,000 tons a year.

By 1962, it is stated, total plate capacity should reach 1,000,000 tons annually. A new steel melting shop is designed to produce over 800,000 ingot tons of steel a year and will bring the company's steel-making capacity up to nearly 2,000,000 tons a year.

The six projects are:—The installation of 78 coke ovens on a completely new site, as opposed to the additional 26 ovens on the existing site, together with the necessary by-product plant and a coal-handling and blending plant; an extension of ore handling and stocking plant at the West Hartlepool works; the installation of a 27-ft. 6-in. dia. blast furnace, with provision for a second large furnace to be constructed later; a new melting shop with six open-hearth tilting furnaces each of 350 tons capacity and two mixers each of 600 tons capacity; an ingot preheater furnace and eight soaking pits, and a new slabbing mill with a capacity of 1,500,000 ingot tons a year with provision to increase this throughput; a four-high 12-ft. 6-in. plate mill.

Perry's Quarter Century Club

The firm of G. Perry & Sons, Limited, Hall Lane, Leicester, were hosts to the members of their Quarter Century Club when a dinner was held at the Bell Hotel. Mr. S. J. Perry presided over the gathering which numbered 85 and included the 25 members of the Club, together with the wives and members of the staff. During the evening, a presentation of a gold watch was made to Mr. F. J. Grove, a member of the staff with 49 years' service.

From the menu, it is learnt that the firm was established in 1889 by the late Mr. George Perry, father of the present joint managing directors, Mr. S. J. and Mr. W. C. Perry. The firm now employs 230 people and claims to be the largest patternmaking business in the world. In 1955, the directors purchased a sports ground and pavilion near to the works for the benefit of their employees. The third generation of the family is now represented by Mr. Basil, Mr. Roger and Mr. Martin Perry, sons of the present joint managing directors.

Equipment & Supplies

Electric Motors

Advantage of the high-temperature rise allowed by the British Standards Institution in draft specification cw(ELE)6246 and BS 2613 has been taken in new models produced by Newman Industries, Limited, Yate, Bristol, a firm which has been making totally-enclosed motors since 1936. The new standards allow a winding temperature with "class E" insulation of 105 deg. C. and thus enable manufacturers to build ventilated squirrel-cage motors which are considerably lighter, cheaper and smaller. The rotors are of particularly rugged construction since the aluminium squirrel-cage conductors are die-cast around the iron core in one piece with the fan vanes at each end. After the rotor has been cast, each core is shrunk on to its shaft and adjusted for dynamic balance on an electronic machine. All the iron castings, aluminium die-castings, the coils, laminated core stampings, and other electrical components incorporated in these motors are made at the works.

It is interesting to record that Newman Industries have facilities for carrying out repairs "on the spot"—they maintain for this purpose a "flying squad" van which can go to any part of the country. In cases where it is necessary to take a motor back to the Yate works, the company makes a temporary replacement so that no inconvenience is caused to the customer while the repair is being effected.

Wall Chart

The latest addition to the Movigraph range of charting systems for works progress systems, distributed by Adapta-Charts, Limited, 129 Hammersmith Road, London, W.14, is the time/load. For this unit, it is claimed that it enables all kinds of states, activities and processes to be built up quickly and easily, and altered with equal facility when applied for such engineering applications as machine loading, planning and progress, etc. It can also be "tailor-made" to fit applications. The basis of the time/load unit is a small interlocking plastics signal. Oblong-shaped, it measures ½ by ¼ in. and a number of these can be interlocked to form a continuous line on a similar principle to the pieces in a child's jigsaw puzzle. This line represents a certain phase or state. As the signals are available in several colours, different states (for example, occupied-time and free-time) are easily recognizable. Each signal has a small plug on its reverse side. This plug fits into an extruded channel screwed to the face of a standard Movigraph panel, which itself consists of a perforated plastic board having 2,000 perforations per sq. ft. Time/load channels can be fitted to the panel so that spare lines of perforations are visible between each. This enables other standard signals (flags, pegs etc.,) to be inserted in the perforations to indicate certain information, (for example, causes of delay, priorities, etc.).

Gas-content Meter for Molten Metals

Known as the "Telegas," a compact and portable meter for direct reading of the hydrogen content of molten metals is now being manufactured by Edwards High Vacuum, Limited, Manor Royal, Crawley, Sussex, under licence from the British Aluminium Company, Limited.* So far, it is mainly applicable to aluminium or aluminium alloys. The standard instrument, shown in operation in Fig. 1, has two ranges of sensitivity giving, in addition, an indication of the temperature. The principle of the operation of this instrument depends upon the diffusion of hydrogen into nitrogen

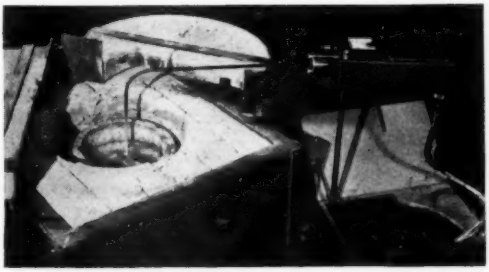


FIG. 1.—*"Telegas" meter in operation, the meter is supported on a clamp above the carrying case and gas-determination apparatus.*

injected into the melt, this is subsequently collected and analysed. In operation a stream of nitrogen bubbles is injected into the melt, diffusion of hydrogen occurs, the amount being proportional to that present in the molten metal. After re-collection the gas is analysed in an electrical gas-determination apparatus, the results from this are converted to a dial, reading direct values. This meter can be held in one hand while a reading is obtained, the probe (of the instrument) of sintered alumina is inserted in the melt and by rotating a handle a cam-operated diaphragm pump is operated, this feeds the nitrogen gas, supplied from a cylinder, into the gas circuit as shown in the circuit diagram Fig. 2.

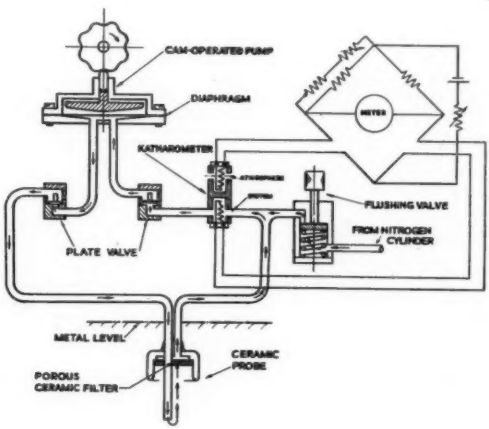


FIG. 2.—*Gas circuit diagram of the "Telegas" hydrogen gas-content meter, manufactured by Edwards High Vacuum, Limited, under licence from the British Aluminium Company, Limited.*

* This equipment, developed by Dr. C. E. Ransley, M.Sc., of the British Aluminium Company, Limited, was described and exhibited by him at a meeting, this session, of the Slough section of the Institute of British Foundrymen. It was also on show at the recent Sheffield Foundry Exhibition, where much interest was shown in its possible application to other metals, particularly steel. Dr. Ransley stated that the difficulty of extending the application to apply to high-melting-point metals lay in finding suitable impermeable refractory tubes but did not regard this as insurmountable.

Foundry Developments Inquiries

British Piston Ring Company, Limited

Owing to physical restrictions imposed by the proximity of nearby housing estates, the British Piston Ring Company, Limited's foundry at Parkgate Road cannot be extended. Resulting from this state of affairs the company located a 16-acre site for the proposed extensions and the construction of a new foundry at Gipsy Lane, Nuneaton; however, planning approval was not granted by the County Planning Authority, supported by local residents. An appeal launched by the company was recently heard at an inquiry conducted by Mr. J. R. Hale, for the Ministry of Housing and Local Government.

Mr. J. V. Vobe speaking for the company, said that the matter was of the gravest importance both for the firm and for Nuneaton. "The appeal has not been brought," he said, "until every other possibility of settlement had been exhausted." Mr. H. C. Blackford, a director and production manager of the company, said that the present foundry was situated 1½ miles from the main works at Holbrook Lane, Coventry, and the Gipsy Lane site was preferred because many of the firm's employees lived at Nuneaton, and it was the nearest site that could be found. In support of this, Mr. A. Greaves, a Coventry estate agent, said that there were no available sites in Coventry at present, and that all attempts to locate an alternative site had been abortive. Land zoned for industry on the outskirts of the city had been largely allocated to firms who had been displaced from the centre of the city, by the redevelopment that was to occur. Also supporting the company's appeal, Councillor E. Waite, chairman of the Planning and Development Committee of Nuneaton Council, who had approved the site in the first instance, said that it was the policy of the Council to encourage industrial development, and that with this in mind, they had recommended that the town map should have been modified to include the appeal site as industrial land. Mr. G. Ashton, Borough Surveyor, spoke of the Council's concern that nearly 9,000 people found their employment in Coventry. "We are being crippled and strangled by the lack of industrial sites in Nuneaton," he said.

In support of the company's appeal, Mr. Blackford stated that because most of the castings would be small in size, noise from fettling would only be slight; in addition there would be no dust or grit, and insignificant traces of smell from core fume. Another factory adjacent to the appeal site would dwarf the proposed foundry, and the nearby residents were already adversely affected by this works.

Mr. J. J. Brooks, County planning officer, said that the proposed erection of a foundry was not objected to in principle, but on the grounds of siting; the site fell within the suggested green-belt area. It would be wrong to encourage further development breaking into the open countryside, and he stated that there was undeveloped-land zoned for industrial purposes at Bedworth and Tamworth.

A resident, Mr. R. F. Moreton, of Nuneaton, said the appeal had been considerably discussed in the neighbourhood, and feeling was so strong that it was decided to invite local residents to attend a public meeting. Although the hall where the meeting was held was a mile away, 65 residents attended. A resolution, that they object most strongly to the erection of another foundry in Gipsy Lane, was carried unanimously. He said that there were loud noises of crashing metal from the factory already there, and these continued at intervals during the day. When the wind blew from the north west there was a foul, sickly smell reminiscent of burning oil or paint. If the proposed foundry were built and caused similar trouble, the houses would suffer from the nuisance almost continuously.

In a petition, 202 residents were against the proposed development, two were in favour and eight were neutral. Altogether a total of 198 people complained of noise, and smell from the existing foundry. Many of the houses had the highest rateable value in the town, and were situated on one of the best residential areas. Four other residents also gave evidence objecting to the proposal. Mr. Lester submitted that apart from consideration of the complaints, the appeal should be turned down on the grounds that if it were allowed it was bound to lead to other similar applications being made for sites along Gipsy Lane.

Summing up, Mr. Vobe said it was apparent that the real bogyman was the word foundry. It was an integral part of his clients' case that they were not bringing the usual obnoxious type of foundry to the site. It was not going to cause terrific noises and smells of which they had heard so much talk that day. Nuneaton was not a Stratford on Avon, nor had it a salubrious air. People had chosen to live in the town, and had chosen to live in the shadow of a foundry. They could not ask Nuneaton nor ask the country to thrive and live well on the income from a view or the capital asset of a green belt.

The results of the inquiry will be made known when a decision is reached by the Minister of Housing and Local Government.

J. W. Richards & Sons

Permission to go ahead with the development of the industrial trading estate at Upper Gornal has not been forthcoming, and the Staffordshire County Council has taken up the matter with the Ministry of Housing and Local Government. This was stated at a local inquiry held recently at Sedgley, by the Clerk to the Sedgley Urban District Council, Mr. K. R. F. Newton, when the Upper Gornal firm of J. W. Richards and Son, of Rock Street,. appealed before the Ministry's Inspector, Mr. R. Lindsay, against the Council's refusal to grant permission for an extension to be built to their foundry premises.

Mr. Newton explained that Sedgley planned as an industrial site an area of about 30 acres near Holloway Street, not far from Richard's site in Hyde's Quarry. The Council had refused permission for the extension because eventually, under re-development, the site would become an open space. The firm's planning permission expired at the end of the year.

The owner of the firm, Mr. John W. Richards, stated that he applied to extend his premises in June last and when refusal came in October, the extension had already been completed. He was under the impression he could stay until 1961, like the majority of the other seven or eight firms in Hydes Quarry. He had thought the planning permission would follow. At the conclusion of the inquiry the Inspector visited the site. The decision of the Minister will be made known later.

METAL INDUSTRIES, LIMITED—Mr. J. R. Twaddle has resigned from the board and also from the following companies of which he was chairman:—John Allan & Company (Glenpark), Limited; Cox & Danks, Limited; Shipbreaking Industries, Limited; Hughes Bolckow Shipbreaking Company, Limited; Metal Industries (Salvage), Limited.

Company News

THOS. FIRTH & JOHN BROWN, LIMITED—CIC consent has been obtained for the rights issue announced in January. The issue is a two-for-five offer.

W. P. BUTTERFIELD, LIMITED, tank manufacturers, of Shipley (Yorks)—Ordinary shareholders took up 56 per cent. of the recent rights issue of 900,000 5s. ordinary shares at 7s. 6d. each.

PRESSED STEEL COMPANY, LIMITED—The directors announce that, in response to their offer of £2,000,000 5½ per cent. convertible debenture stock 1977-82, J. Henry Schroder & Company has received on their behalf applications for more than £22,000,000. It was hoped to post allotment letters on April 4.

METAL BOX COMPANY, LIMITED—Underwriters of the offer of £6,000,000 5½ per cent. unsecured loan stock, 1977-80, have been required to take up approximately half their commitments. The company's preference, ordinary, and loan stockholders, to whom the new loan stock was offered at a price of £98 per cent., took up approximately 50 per cent. of the issue.

PARKINSON & COWAN, LIMITED, manufacturers of gas cookers and meters, hydraulic, electrical, liquid fuel appliances, etc., of London, S.W.1—The dividend of 9 per cent. is to be restored after the 1955 cut to 5 per cent. Group trading profits, which fell from £383,167 to £218,877 in the previous year, amount to £597,497 and there is a net balance of £171,536, compared with the 1955 deficit of £35,456.

TONKS (BIRMINGHAM), LIMITED, general brassfounders, etc.—The application list opened and closed on April 4 for an offer for sale of 400,000 5s. shares at 6s. 3d. per share. The issued capital is £200,000 and profits for the year ended December 31 next are expected at least to equal last year's £124,780 before taxation. The directors expect to pay a 12½ per cent. dividend for the year.

CROFTS ENGINEERS (HOLDINGS), LIMITED—Trading profits increased from £861,173 to £1,168,302. A final dividend of 7½ per cent. makes 12½ per cent. on the £2,000,000 ordinary for 1956. For 1955, payments were interim 7½ per cent. on £800,000 (before simultaneous one-for-two scrip and three-for-eight rights issues, and a subsequent one-for-three scrip issue) and a final 7½ per cent. on the present capital.

PEASE & PARTNERS, LIMITED—All the assets and liabilities of the only remaining subsidiary, Pease & Partners Tees Foundries, Limited, have been absorbed by the parent company. The business of the foundry company will be carried on by the parent company and the subsidiary will be put into voluntary liquidation. The absorption is to allow greater convenience in operating, together with a saving in administration expenses.

RICHARD CRITTALL & COMPANY, LIMITED, heating and ventilating engineers, of London, W.1—The final dividend is 17½ per cent. to make 27½ per cent. for the 18 months to December 31, 1956, on the £350,000 one-class capital. The sole payment for year 1954-55 was 17½ per cent. Group's taxed net profit for the period is £140,007, against £79,132 for the previous 12 months. The latter included £1,466 EPT recoverable. Tax charged was £17,233 (£3,430).

NORTH BRITISH LOCOMOTIVE COMPANY, LIMITED—A group net loss for 1956 of £508,083, against a profit of £101,510 in 1955, is reported. The change-over from the manufacture of steam to diesel locomotives, which largely took place during the year, proved more difficult than could reasonably have been foreseen and output was insufficient to absorb overheads. The year-end improvement should continue. Ordinary holders receive 5 per cent. dividend (same).

PROJECTILE & ENGINEERING COMPANY, LIMITED—The dividend, at 5 per cent., has been halved for 1956. Net profit, after tax of £33,928 (£67,195), has declined from £74,264 to £27,600. The machinery manufacturing division made a further advance in the sales of proprietary products, and production of machinery for the plastics and diecasting industry is on an expanding basis. The company plans to increase the turnover in this section by other diversity in machine manufacture.

DAVID BROWN CORPORATION, LIMITED (holding company for subsidiaries manufacturing gears, gear units, agricultural equipment, etc.), of Huddersfield (Yorks)—A net loss, subject to audit, of £1,615 for the year to June 30, 1956, compares with a previous net profit of £612,684. With £1,174,163 brought in, there is £47,438 for preference dividend on the £1,500,000 preference capital and £1,224,887 is carried forward. As in previous years there is no dividend on the £1,000,000 ordinary.

RIVET, BOLT & NUT COMPANY, LIMITED—Application is to be made to the CIC for permission to issue additional capital, probably in the latter part of this year. The board envisages an issue on the basis of one share for every three at par. The chairman, Mr. J. B. Macouat, points out that the recent acquisition of the capital of A. P. Newall & Company, Limited, had for the moment been financed by the company out of its own resources. The boards of the two companies in consultation with their auditors had arrived at a fair price for the Newall business, and the directors considered it would yield an adequate return on capital invested.

Contracts Open

The dates given are the latest on which tenders will be accepted. The addresses are those from which forms of tender may be obtained. Details of tenders with the reference ESB can be obtained from the Board of Trade Export Services Branch, Lacon House, Theobalds Road, London, W.C.1 (telephone: CHAncery 4411, ext. 738 or 771). unless otherwise stated.

GREECE, April 24—Foundry metals, including pig-iron, aluminium ingots, white anti-friction metal, iron-manganese, pig-iron, nickel, tin-ingots, manganese-bronze, ferro-silicon, zinc plates, for the State Procurements Services. (ESB/7529/57.).

TURKEY, April 20—Desilvered pig-lead, for the ICA Procurement. Interested suppliers should contact the buyer, Petrol Ofisi Umum Murduriugu, Selanik Cad. 60, Ankara, Turkey. (ESB/9148/57/ICA.)

INDIA, May 15—Diesel locomotives, for Portuguese India. (ESB/6219/57.)

SOUTH AFRICA, April 17—Electric furnace, for the Stores Department of the South African Railways. (ESB/7849/57.)

SOUTH AFRICA, April 16—Pipe and bolt-screwing machinery, for the South African Railways. (ESB/7912/57.)

INDIA, April 19—Railway vacuum-brake equipment. (ESB/7951/57.)

NEW ZEALAND, April 16—Crane-weighers and platform scales, for the Wellington Harbour Board. (ESB/8284/57.)

BELFAST, April 18—Supply and installation of metal window-frames and ventilating louvres. Ministry (Room 103) of Finance, Law Courts Building, May Street, Belfast.

BURMA, April 23—Valves, G.M.-wheel-fullway. (ESB/8593/57.)

PORTUGUESE EAST AFRICA, June 6—Hydraulic press. (ESB/7919/57.)

INDIA, May 1—Valves for hydro-electric projects. (ESB/8183/57.)

AUSTRALIA, May 8—Remelting furnaces, 15-cwt. capacity. (ESB/8541/57.)

AUSTRALIA, May 8—Rotary-precision wood-planing machine. (ESB/8364/57.)

NORTHERN IRELAND, May 7—Supply and erection of high-pressure pipework and valves, for the Electricity Board. Deposit £5 5s. Documents from Kennedy and Donkin, 64, Royal Exchange, Manchester.

Book Reviews

Industry and Press Relations, by Peter Hayle. Published by Staples Press, Limited, Mandeville Place, London, W.1; price 12s. 6d. net.

It might not be a bad idea if every candidate for an appointment as Press officer to a firm or organization were made to sit an examination based upon Mr. Peter Hayle's book. A good pass in such an exercise would tell the prospective employer that the applicant had a sound working knowledge of the way in which to deal with the Press enquirer to the satisfaction of both parties. Mr. Hayle has, in short, written a most useful book. His advice and his judgments appear to be based firmly on close study and considerable practical experience. The present reviewer, with almost too many years behind him both as Pressman and Press Officer, has been unable to fault the author on a single point within the limits he appears to have assigned to his study.

Let none think that such a book cannot be of value to the foundryman. It can, if he be concerned with the commercial management of his foundry, especially in teaching him the first principles whereby he may turn to account the news columns of the trade Press and the newspapers in the foundry's locality, and do it in a way mutually helpful to his business and to the editors. But he and his fellow foundry managers must brace themselves to appreciate objectively the value of publicity; at present too few of them do.

One thing that Mr. Hayle might have done to double the value of a valuable work—he could have given advice on the technicalities of preparing matter for the Press. The rules are few and simple; yet in hundreds if not thousands of cases they are broken. This is because the statements, notices, descriptions and so on emanating from the many Press officers, publicity managers and others deputed by their chiefs to act as such but who lack journalistic training, add to the newspapers' practical difficulties in sub-editing. They thus start with a severe and unnecessary handicap in the race for column inches.

Mr. Hayle is sound on the length and kind of thing to be included in some Press notices, but he could have given readers more on the technical business of presentation, the methods of preparing copy that make it easier to use. Similarly, advice on co-operation with Press photographers would have been useful. Nevertheless, this is a book to be read, kept, and used for reference by any foundryman who wishes to get the right sort of news publicity for his business.

B. H. T.

Final Forming and Shaping of Wrought Non-ferrous Metals. A symposium held in London in April, 1956, and published by the Institute of Metals, 17, Belgrave Square, London, S.W.1; price 21s.

This monograph is a reprint from the *Journal* of the Institute of Metals and contains eight papers which were contributed to the symposium. They are: "Machining Properties of Non-ferrous Metals" by D. F. Galloway; "Deep Drawing and Spinning of Sheet Metal, with Particular Reference to Non-ferrous Materials" by John A. Grainger; "Rubber Pressing" by J. Fielding; "Research into Some Metal-forming and Shaping Operations" by W. Johnson; "Cold Roll-forming and Manipulation of Light-gauge Sections" by E. Griffin; "Stretch-forming of Non-ferrous Metals" by R. D. Edwards; "Bending and Allied Forming Operations" by T. G. Perry, and "The Hot Forming of Magnesium Alloys" by R. G. Wilkinson.

All of them are of a high standard and are first-class examples of the scientific approach to production problems. They were reviewed by Mr. W. C. Hesselberg, M.A., F.I.M., who acted as *rapporteur* and his comprehensive summary of them should be read before reference is made to individual papers. Dr. Galloway's paper and Mr. Perry's paper are of general interest and may, with advantage, be read by all production engineers who are concerned with the forming and shaping of wrought non-ferrous metals. As indicated by their titles, the other papers are of a more specialized nature. The discussion was on a high level and the authors dealt adequately and helpfully with all the points that were raised. As is usual with publications made under the auspices of the Institute of Metals, the volume is well printed and the reproduction of the photographs is excellent.

J.F.K.

Publications Received

Safe Coupling of Ingot Casting Cars and Scrap Pan Bogies; Safe Operation of Bar Reeling and Straightening Machines; and Prevention of Gassing Accidents in Iron and Steel Works. Three brochures published by the British Iron and Steel Federation, Steel House, Tothill Street, London, S.W.1.

The three brochures have one factor in common; and that is a complete breakaway from the notion that accident-prevention propaganda should be based on slogans. This is replaced by advocating improved machine design; the emphasis on breaking down problems into component parts; and "doing something about them." In the case of gassing accidents, it is recommended that there should be set up a complete organization for encompassing their reduction, and for formulating a plan to minimize effects. In these booklets a lead has been given to other industries in the logical approach to accident prevention.

Bulletin of the British Cast Iron Research Association, Vol. 13, No. 11. Issued by the Association from Alvechurch, Birmingham.

This issue contains a very complete list of films (about 125) germane to the manufacture of iron, steel, and ferrous and non-ferrous castings; one on die-casting is also included. It is a very useful list for organizers of technical meetings and training officers to keep by them.

Some Aspects of Fire Prevention in Industrial Buildings, by M. J. Reaney. Published by Colt Ventilation Limited, Surbiton, Surrey.

The author is now general manager of the American Associate of Colt. In this publication, he deals with an aspect of fire prevention which will be new to many. The account makes very interesting reading and explains how "fire-proof" buildings can be reduced to ashes. It is available to readers on writing to Surbiton.

Heads and Threads—Buyers' Guide, 1957. Published for the British Bolt, Nut, Screw and Rivet Federation by Heathcote & Coleman, 69, Harborne Road, Edgbaston, Birmingham, 15, and Peat, Marwick, Mitchell & Company, Queens Square, Middlesbrough.

Buyers of these goods—and what firm is not—will find this guide extremely useful, as not only are the sources of supply clearly indicated, but the appropriate B.S. specifications are also included.

News in Brief

EXTENSIONS to the premises of the Yale & Towne Manufacturing Company, lock and hardware division, Willenhall, are being officially opened on April 17.

GENERAL REFRACTORIES, LIMITED, Genefax House, Sheffield, 10, have just issued a 24-page booklet covering the refractory requirements for Portland-cement kilns.

GLOW WORM BOILERS, LIMITED, Milford, Derbyshire, started a four-day week on April 1, due to a normal seasonal decline in orders. About 125 workers are affected.

SOLIDUS FOUNDRIES (HERRINGTON), LIMITED, Philadelphia, Houghton-le-Spring, Co. Durham, has plans in hand to build a workshop on a site off Raglan Row, Philadelphia.

THE POSY BOWL which will be presented to the Queen when she visits Oldbury on April 23, will be made of titanium. The bowl carries the Oldbury coat of arms in colour.

THE Blythswood Shipbuilding Company, Limited, Glasgow, has received an order for a 19,000-ton tanker from the Texas Company (Norway) A/S, of Oslo. It is due for delivery in 1960.

WITH THE THEME of the "Plant Engineer's Adaptability to Change," the tenth annual conference of the Incorporated Plant Engineers will be held at the Palace Hotel, Buxton, from May 15 to 17.

THE CONGRESS of the *Bureau International de la Recupération* (BIR), which includes the annual general assembly, will take place at Cannes, on the French Côte d'Azur, on June 5, 6, and 7.

EMPLOYEES in the Coventry factories of the Rootes group, who qualified for long-service awards during 1956, received them on April 4 from Mr. Geoffrey Rootes, deputy chairman and managing director.

SIR GRAHAM CUNNINGHAM, chairman of the Triplex group, has announced the appointment of the machine tools division of George Cohen Sons & Company, Limited, as sole world agents for Eldair alligator shears.

A NEW COMPANY, Tunny Cranes, Limited, has been formed to manufacture medium-capacity mobile cranes for mechanical-handling purposes in many industries. Its registered offices are at Evenlode Place, Moreton-in-the-Marsh (Glos).

CANADIAN STEEL FOUNDRIES (1956) LIMITED, Montreal, have recently installed a large shotblast cleaning plant, measuring 28 by 22 by 12 ft. The plant is fitted with a turntable, and one car-load will take 100 tons of castings.

From April 1 to 5 an "open week" was held at the Trafford Park works of Metropolitan-Vickers Electrical Company, Lmited, when over 140 potential graduates from 23 colleges and universities throughout the British Isles visited the works.

THE *Crucible*, a bulletin issued by the (American) Non-ferrous Founders Society, suggests that band-saw costs can be halved by shotblasting castings, with their runners and risers attached, in three minutes. Moreover clean scrap for remelting would be provided by this procedure.

AMONG THE AWARDS to the transport department of Samuel Osborn & Company, Limited, Sheffield, was a diploma presented to Mr. George Lilley—his fourth. He has driven 29,084 miles all over the country without an accident. Last year the firm's drivers covered 340,137 miles.

PROMPT ACTION by the fire service averted a serious fire at the canteen for aluminium foundry workers of Rolls-Royce Limited, Cotton Lane, Derby, on April 5. A canteen kitchen was gutted, when overheated fat from a fish frier set fire to the premises. The canteen caters for about 200 workers.

A CONTRACT for the installation of pipework at the atomic plant at Springfields (Lancs), has been awarded to Mitchell Engineering, Limited, Peterborough, by the Atomic Energy Authority. This contract is the fifth to be awarded to Mitchell companies by the AEA for civil engineering and pipework on atomic projects.

TO PROMOTE EXPORTS, an agency to be known as the Deutsche Stahlrohr Export G.m.b.H., is to be formed by 11 West German steel companies. Included among the companies are Mannesmann Huttenwerke A.G., Phœnix-Rheinrohr, and Hahnsche Werke A.G. About one third of their production will be available for export.

TOTAL PIG-LEAD (minimum content 99.95 per cent. Pb) production in OEEC producer countries (Austria, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, the UK, and Sweden, as well as in Morocco and Tunisia) amounted to 48,042 metric tons in February, compared with 52,069 tons in the previous month.

AN ORDER, valued at $1,000,000, for spun-iron pipes has been given to the Stanton Ironworks Company, Limited, Nottingham, by the Government of Venezuela. The pipes range in diameter from 80 mm. to 750 mm. and are concrete lined and fitted with Stanton screwed-gland and bolted-gland flexible joints. The material will be used for extensions to the Caracas water system.

HELP TO OVERCOME expected power shortages in Singapore is to be provided by electric-power plant supplied by the Free Piston Engine Company, Limited, a branch of Associated British Engineering, Limited. The city council has awarded a contract valued at $M13,900,000 for generating plant in six units with a total capacity of 136,000 kw. The plant should be in full operation by 1961.

Mr. G. F. HOWARD, chairman of Spear and Jackson, Limited, Sheffield, presented trophies at the annual dinner and presentation following the turnout of the works fire brigade in Sheffield on March 29. At the ceremony, Mr. S. J. Bartholme, joint managing director, made a retirement gift to Mr. C. Burkhard who had been fire brigade captain for 30 years. The new captain of the brigade is Mr. David Bridge.

LARGELY because of the increased imports of oil and iron ore, the revenue of the Tees Conservancy Commission from river dues increased in February by £7,026 and in the four months ended February 28 by £13,669. Since November 1,108 tankers have delivered oil or received oil bunkers at the new oil berths, compared with an average of 16-20 per annum before the operation of the new Shell-Mex oil distribution depot.

AN ORDER worth more than $2,000,000 (£750,000) for aluminium conductors for the Quebec Hydro-electric Commission, Canada, has been obtained by the Aluminium Wire & Cable Company, Limited, Swansea. Two of the company's senior technical staff flew to Canada at three days' notice and attended meetings of the commission for two days. They were followed by the sales manager, who waited on the commission for three weeks.

THE OWEN ORGANIZATION have recently extended their group of companies to the Union of South Africa by the formation of Rubery, Owen & Scott (S.A.),

News in Brief

Limited. This firm will be responsible for the manufacture and marketing of certain products of the Owen organization which will initially include steel pallets, trailer axles, washing machines, steel nuts and bolts and Easiclene domestic equipment. The address will be:—Rubery, Owen & Scott (S.A.) Limited, 19-49 Scott Road, Congella, Durban.

EFCO, LIMITED, Netherby, Queens Road, Weybridge, Surrey, announce that they have an exclusive licence from the Lectromelt Furnace Company of Pittsburgh, USA, for the UK, Australia, New Zealand, etc. (with non-exclusive rights in other countries) for the sale of Efco-Lectromelt Arc Furnaces. The Electric Furnace Company, Limited, have been building electric-arc furnaces since 1910, whilst the Lectromelt Company pioneered the swing-roof arc furnace in sizes from ¼ to 200 ton capacity.

HADFIELDS LIMITED announce that their range of crushers has now been extended to embrace new roller-bearing crushers and granulators. This new addition to the existing range will enable the firm to offer a comprehensive and varied range of their products in all sizes to suit all requirements. The first three roller-bearing crushers to come off the production line are:—(*a*) 36 by 24 in. Blake-type crusher with sectional (4 piece) cast-steel frame; (*b*) a 24 by 12 in. Blake-type crusher with one-piece cast-steel frame, and (*c*) a 36 by 5 in. jaw-type granulator (single toggle) with one-piece cast-steel frame.

Mr. A. J. WOOD chairman of the Valor Company, Limited, said at the annual general meeting in Birmingham, on April 3, that although demand had not been so heavy in the brass department, the company's export sales last year were the highest so far achieved. It was fitting that the past year should be the most successful in the firm's history since the current year marks the 60th anniversary of the formation of the original company. On future prospects, and particularly the proposal to create a free-trade area in Europe, Mr. Wood said that the company awaited competition confidently but that it would call forth all their energies to combat it.

THE HALFORD CYCLE COMPANY, LIMITED, which celebrated its golden jubilee in the week beginning April 1 is distributing £14,000 among its 2,086 employees as an anniversary gift. The lowest bonus is 10s. for employees who have been with the firm for less than three months and the highest £25 for those with more than 20 years' service. Silver caskets have been presented to seven employees with more than 35 years' service and watches to another 21 with 25 years' service. The Lord Mayor of Birmingham, Ald. E. W. Apps, attended the jubilee dinner and dance given by the firm on April 3 to 420 head-office employees.

TWO NEW DEEP-WATER BERTHS for ocean-going shipping at the port of Lobito in Angola (Portuguese West Africa) were formerly opened on April 6 by His Excellency the Governor-General of Angola. This latest port development gives an extension of over 800 ft. in length to the South Quay, equipped with four additional cranes, including one of 10 tons. Future plans in the port development programme include a mechanized mineral quay with a daily loading capacity of 5,000 to 6,000 tons. This is at present under construction by the British company, Spencers (Melksham) Limited, and is due for completion in December 1959.

THE BRITISH NATIONAL COMMITTEE of the *Fédération Européenne de la Manutention* have appointed Mr. P. B. Silk (Babcock & Wilcox, Limited) as their chairman in succession to Mr. John M. Morris (Coventry Climax Engines, Limited) who has held that office for the past 2½ years. The Federation has made considerable progress since its inception in November 1953 in the integration of the European mechanical-handling industry and is becoming increasingly important in view of the proposed European free-trade area. The British national committee has already made considerable contributions to the Federation's achievements through its delegates drawn from the Association of Crane Makers, Association of Lifting Tackle Makers, Industrial Truck Manufacturers' Association and the Mechanical Handling Engineers' Association. In view of the probability of the British Government identifying itself with the European free-trade movement the Committee, in watching over British interests and maintaining British prestige in Europe, will assume increasing importance and responsibility.

Law Case

Breach of Controls by Stanton Ironworks Company, Limited

"A flagrant breach of the controls" was alleged against the Stanton Ironworks Company, Limited, at Derbyshire Quarter Sessions, when 17 charges of buying scrap iron at a price exceeding the controlled figure were admitted by the company. Fines totalling £260 with costs up to 100 guineas were imposed.

Mr. Victor Durand, prosecuting for the Board of Trade, said that although the charges together involved only 113 tons of metal, for which a total of £85 was overpaid, the offences were "a flagrant breach of the controls." This substantial company was one to which the Board of Trade turned for guidance in the price structure, said Mr. Durand. Someone in the company's purchasing department had been "over enthusiastic—over anxious to ensure continuity in the supply of scrap metal," he said.

For the company, Mr. Mervyn Griffith-Jones submitted that there was no inducement on the company's part to pay more than the maximum permitted price. Over a period of 18 months the company spent as much as £2,000,000 on scrap. "Compared with the size of the business the amounts of the charges are insignificant, yet Board of Trade inspectors examined as many as 10,000 invoices before bringing the case," said Mr. Griffith-Jones. The offences had arisen out of the difficulty of working a foolproof system with a company the size of Stanton Ironworks.

Fining the company £100 on the first count, and £10 on each of the 16 others, the chairman, Mr. Richard Elwes, QC, remarked: "The importance of these regulations is obvious and we have a clear duty to insist on compliance with them. It is quite clear that the quantity with which we are concerned is very small in comparison with the amount of scrap business done by the company. Also, a very close and stringent investigation has been carried out by the prosecution. We heard with some sympathy the argument concerning the very great difficulties of industrial administration. We consider that to some extent the company must have confidence in its suppliers, but, of course, we cannot accept that as an excuse for the breaches. It is suggested that this was a deliberate and flagrant breach, but we could only accept that view if we were satisfied that somebody in the employ of the company had deliberately conspired to commit the breaches. There is no evidence to support that."

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Pig-iron and Steel Production

Statistical Summary of January Returns

The following particulars of pig-iron and steel produced in Great Britain are from statistics issued by the British Iron and Steel Federation. Table I summarizes activities during the past six months. Table II gives production of steel ingots and castings in January and Table III, weekly average production of finished steel. Table IV gives the production of pig-iron and ferro-alloys in January, and furnaces in blast. (All figures weekly averages in thousands of tons.)

TABLE I.—*Iron and Steel Price Index and General Summary of Pig-iron and Steel Production.*

Period.	B.o.T. Price Index, 1938 = 100.			Iron-ore output.	Imptd. ore used.	Coke to blast-furnaces.	Pig-iron, ferro-alloys prod.	Scrap used in steel prod.	Steel (incl. alloy).			
	I. & S.	Coal.	Basic[1] materials (excl.fuel).						Imports.[2]	Prod. ingots, castings.	Delivrs. finished steel.	Stocks.[3]
1953	260	350	506	304	207	237	215	188	17	339	262	982
1954	263	364	498	299	234	238	229	198	7	356	277	931
1955	276	399	529	311	244	246	240	213	20	381	305	1,183
1956—Aug.[4]	300	463	541	279	258	259	236	179	18	341	227	1,560
Sept. ..	300	465	545	301	269	367	253	231	18	417	330	1,513
Oct.[4]	300	465	540	317	279	266	261	229	21	419	328	1,445
Nov. ..	300	470	553	328	275	262	263	234	16	426	341	1,403
Dec. ..	308	471	561	324	276	266	262	212	15	396	295	1,444
1957—Jan.[4] ..	317	472	558	346	273	267	257	224	13	416	—	1,385

TABLE II.—*Weekly Average Production of Steel Ingots and Castings in January*, 1957.

District.	Open-hearth		Bessemer.	Electric.	All other.	Total.		Total ingots and castings.
	Acid.	Basic.				Ingots.	Castings.	
Derby, Leics., Notts., Northants and Essex ..	—	4.3	14.5 (basic)	2.5	0.1	20.1	1.3	21.4
Lancs. (excl. N.W. Coast), Denbigh, Flints. and Cheshire	1.4	36.1	—	2.6	0.4	39.0	1.5	40.5
Yorkshire (excl. N.E. Coast and Sheffield) ..								
Lincolnshire	—	45.0	—	—	0.1	45.0	0.1	45.1
North-East Coast	0.8	78.8	—	1.5	0.4	79.4	2.1	81.5
Scotland	2.7	42.2	—	2.2	0.4	45.4	2.1	47.5
Staffs., Shrops., Worcs. and Warwick	—	19.9	—	1.2	0.7	20.0	1.8	21.8
S. Wales and Monmouthshire	4.9	81.0	7.0 (basic)	1.2	0.2	93.5	0.8	94.3
Sheffield (incl. small tonnage in Manchester) ..	9.2	33.9	—	12.4	0.5	53.9	2.1	56.0
North-West Coast	—	1.8	5.3 (acid)	0.6	0.1	7.7	0.1	7.8
Total	19.0	343.0	26.8	24.2	2.9	404.0	11.9	415.9[5]
December, 1956	16.3	329.6	25.2	22.1	2.7	384.6	11.3	395.9
January, 1956	19.2	334.9	25.2	23.0	2.9	393.8	11.4	405.2

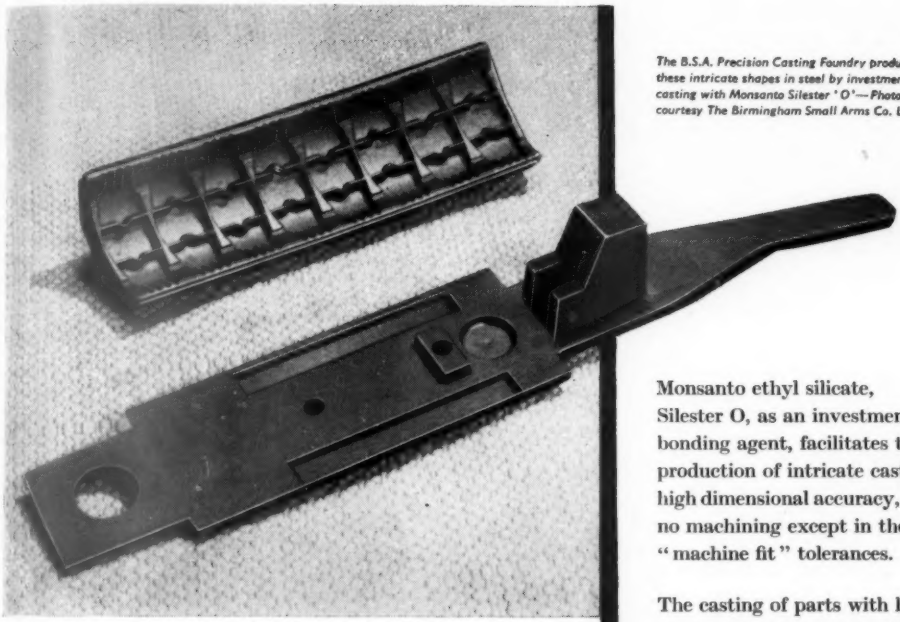
TABLE III.—*Production of New Non-alloy and Alloy Finished Steel.*

Product.	1955.	1956.	1955.	1956.	
			Dec.	Nov.	Dec.
Non-alloy steel:					
Ingots, blooms, billets and slabs[5]	4.9	4.7	4.6	4.8	4.1
Heavy rails ..	9.4	9.7	9.2	11.3	9.9
Sleepers, etc. ..	2.0	1.8	3.2	2.0	1.9
Plates, ⅜ in. & over	26.4	30.3	30.1	35.7	33.6
Plates ⅜ in. to ⅛ in.	19.7	19.9	20.9	21.8	20.3
Other heavy prod.	47.8	49.5	47.3	53.7	47.7
Ferro-concrete bars and rods ..	7.0	7.8	7.2	9.0	7.1
Wire rods ..	22.2	22.9	23.0	24.8	20.5
Arches, etc. ..	9.6	10.1	9.6	11.5	10.3
Other light sections	36.8	41.4	39.0	45.3	40.0
Bright steel bars ..	7.8	8.0	8.1	8.2	6.8
Hot-rolled strip ..	24.1	24.5	23.3	24.5	21.3
Cold-rolled strip ..	8.1	7.5	8.1	6.8	5.7
Sheets incl. coated:					
(i) Hot rolled ..	16.6	15.0	15.6	14.9	11.8
(ii) Cold reduced	26.1	24.8	24.6	28.3	21.3
Tin. and terneplate	15.6	15.9	15.4	18.7	16.0
Blackplate	1.4	1.3	1.3	1.0	1.0
Steel tubes, pipes	22.9	26.2	23.7	30.0	25.2
Tube, pipe fit'gs ..	0.4	0.5	0.5	0.5	0.4
Tyres, wheels, axles	4.8	4.6	4.7	4.7	5.1
Forgings (excl. drop forgings) ..	2.5	3.0	2.7	3.5	3.1
Steel castings ..	4.2	4.5	4.2	5.0	4.4
Tool, magnet steel	0.3	0.3	0.3	0.3	0.3
Total	320.6	334.2	326.6	366.3	317.8
Alloy steel	15.8	17.3	16.5	18.7	15.6
Total deliveries from U.K. prod.[6] ..	336.4	351.5	343.1	385.0	333.4
Add: Imported finished steel ..	18.9	19.6	26.9	12.0	12.0
	355.3	371.1	370.0	397.0	345.4
Deduct: Intra-industry conversion[7] ..	50.9	55.2	50.8	57.5	51.3
Total new material ..	304.4	315.9	319.2	339.5	294.1

TABLE IV.—*Production of Pig-iron and Ferro-alloys during January* 1957.

District.	Fur. naces in blast.	Hema-tite.	Basic.	Foun-dry.	Forge.	Ferro-alloys.	Total.
Derby, Leics., Notts., Northants and Essex	26	0.3	25.0	26.9	0.7	—	52.9
Lancs. (excl. N.W. Coast), Denbigh, Flints. and Cheshire ..	7	—	19.6	—	—	1.5	21.1
Yorkshire (excl. N.E. Coast and Sheffield) ..	—	—	—	—	—	—	—
Lincolnshire ..	10	—	38.5	—	—	—	38.5
North-East Coast	19	4.5	51.1	—	—	—	55.6
Scotland	8	—	16.0	1.8	—	—	17.8
Staffs., Shrops., Worcs., and Warwick ..	7	—	10.8	1.6	—	—	12.4
S. Wales and Monmouthshire	9	4.8	29.2	—	—	—	34.0
Sheffield ..	2	—	3.5	—	—	—	3.5
North-West Coast	9	19.9	—	0.1	—	1.1	21.1
Total	97	29.5	193.7	30.4	0.7	2.6	256.9[5]
December, 1956 ..	99	30.1	201.2	27.0	1.3	2.7	262.3
January, 1956 ..	102	29.5	195.1	31.5	1.0	3.6	260.7

[1] Used in non-food manufacturing industry.
[2] Weekly average of calendar month.
[3] Stocks, mainly ingots and semi-finished, at the end of the years and months shown.
[4] Five weeks, all tables.
[5] Other than for conversion into any other form of finished steel listed.
[6] Includes finished steel produced in the U.K. from imported ingots and semi-finished steel.
[7] Material for conversion into other products also listed in this table.



The B.S.A. Precision Casting Foundry produced these intricate shapes in steel by investment casting with Monsanto Silester 'O'—Photograph courtesy The Birmingham Small Arms Co. Ltd.

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Monsanto ethyl silicate, Silester O, as an investment bonding agent, facilitates the production of intricate castings of high dimensional accuracy, requiring no machining except in the case of "machine fit" tolerances.

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Personal

Mr. M. V. SPURWAY has been appointed a director of Lake & Elliot, Limited.

Mr. ARTHUR BENEY has retired from the board of Tweedales & Smalley (1920), Limited.

Mr. J. O. HITCHCOCK, a director of the Mond Nickel Company, Limited, has been elected a director of Henry Wiggin & Company, Limited.

Mr. AUSTIN MORLEY, managing director of W. & T. Avery, Limited, has been elected a member of the Council of the Birmingham Chamber of Commerce.

British Tyre & Rubber Company, Limited, announce the appointment of Mr. E. N. LOWE as senior export sales executive, Mr. Lowe was previously overseas manager of Semtex, Limited.

Mr. E. J. POWER has been appointed executive director of the automotive division of Birfield Industries, Limited, which is now the selling organization of the Birfield group of companies.

Mr. JOHN HUNTER, chairman of British Northrop Loom Company, Limited, has resigned from the board; Mr. W. L. GRIMSHAW and Mr. H. D. WINTER have been appointed directors of the company.

W. C. Holmes & Company, Limited, Turnbridge, Huddersfield, announce that Mr. A. J. M. HENSHAW, M.A., director, has been appointed general sales manager and Mr. W. SYKES the contracts manager.

Mr. A. J. STEWARD, deputy treasurer of Imperial Chemical Industries, Limited, has retired. He is succeeded by Mr. A. E. FROST and Mr. S. W. WEYSOM, who have been appointed joint deputy treasurers.

Mr. D. W. MANSELL, the newly appointed executive director of the National Gas & Oil Engine (Export) Company, Limited, of Ashton-under-Lyne, flew from London recently for a round-the-world sales tour.

Mr. F. BONNER, manager of the drawing offices at the Hebburn-on-Tyne works of Baker Perkins, Limited, engineers and ironfounders, has been presented with two travelling cases to mark his retirement after 41 years' service.

Mr. F. F. L. MORGAN has been appointed a director of the Climax Rock Drill & Engineering Works, Limited. Mr. J. T. HOLMAN has resigned from the board, and Mr. W. C. FOULDS takes the place of Mr. J. GILCHRIST as secretary of the company.

Mr. A. J. NICHOLAS, joint managing director of Aberdare Cables (Holdings), Limited, and managing director of South Wales Switchgear, Limited, has taken office as president of the Industrial Association of Wales and Monmouthshire for the ensuing year.

Alldays & Onions, Limited, announce that Mr. J. ERSKINE, having retired at the end of March, has resigned the position of managing director of the company and Mr. LEONARD LEE, A.C.G.I., M.I.MECH.E., A.M.I.CHEM.E., has been appointed managing director from April 1.

Mr. R. HAYNES assumed his appointment as director of research at the Coil Spring Federation Research Organization's new laboratories at Hoyle Street, Sheffield, on April 1. He succeeds Dr. R. GENDERS, who is maintaining his association with the organization in a consultative capacity.

The newly elected president and vice-president, respectively, of the British Compressed Air Society are, Mr. G. F. DAVIES, deputy chairman of Hick, Hargreaves & Company, Limited, engineers and ironfounders, of Bolton (Lancs), and Mr. W. B. RAINBIRD, of the Climax Rock Drill & Engineering Works, Limited, London, E.C.2.

Councillor W. G. PALLETT, J.P., F.C.W.A., has accepted an appointment as managing director of Brayshaw Furnaces & Tools, Limited, Manchester, 12, and has taken up his duties immediately. Mr. Pallett is a member of the Sheffield City Council and was until recently managing director of the Laycock Engineering Company, Limited, Sheffield. As from the beginning of April, Mr. W. T. C. RODEN became technical general manager of the Brayshaw company.

Mr. H. C. HAWKINS of B.X. Plastics, Limited, has been appointed president of the Combustion Engineering Association for the year 1957/58. Sir JOHN CHARRINGTON (Charrington, Gardner, Locket & Company, Limited); Mr. B. SAMUELS; Sir PERCY SANDERS (Association of Shell Boilermakers); and Mr. E. W. THOMPSON (John Thompson, Limited) have been elected vice-presidents, and Mr. L. N. HORNE (Charrington, Gardner, Locket & Company, Limited) and Mr. E. W. BARNES (Riley (IC) Products, Limited) are to be chairman of the Council and hon. treasurer respectively.

Obituary

Mr. ALFRED BUTLER, formerly sales manager of E. Green & Son, Limited, fuel economizer and air preheater manufacturers, of Wakefield (Yorks), died recently.

Mr. ARTHUR BIRKETT, a director of T. M. Birkett, Billington & Newton, Limited, non-ferrous founders and engineers, of Hanley, Stoke-on-Trent, died in Durban on March 27.

Col. RUPERT DIBDIN HESELTINE, who died on April 2, aged 55, was the South Wales local director of Dawnays, Limited, bridge and structural engineers, of London, S.W.11. He was a member of the Institution of Structural Engineers and a deputy lieutenant of Glamorgan.

Mr. BASIL RAWDON JACKSON, who died recently, was 64. He retired from the chairmanship of the British Petroleum Company, Limited, in January, owing to ill health. He was also until recently joint chairman of Shell-Mex & B.P., Limited, chairman of B.P. Tanker Company, Limited, and a director of several other British Petroleum group companies.

Recent Wills

PEMBERTON, WILFRED, late iron and steel merchant, of Hunslet, Leeds £3,376

McCONNOCHIE, WILLIAM, an authority on a.c. motor design, for 43 years with the British Thomson-Houston Company, Limited, Rugby £9,138

TOSTEVIN, ENGINEER-CAPT. H. B., former Professor of Marine Engineering at the Royal Naval College, Greenwich, chief engineer, marine department, Vacuum Oil Company, Limited, and Admiralty engineer overseer, Cammell Laird & Company, Limited, Birkenhead £7,682

SMITH, SIR WILLIAM VERDON, for 27 years (until 1955) chairman of the Bristol Aeroplane Company, Limited, a director of many other companies, including Babcock & Wilcox, Limited, Short Bros., & Harland, Limited, a past president of the West of England Engineering Employers' Association, and for some years a member of the management committee of the Engineering Employers' Federation £594,391

Facts from the record
of Goodyear conveyor belting

STACKER

APPLICATIONS

A super quality belting for use where there is severe and frequent abrasion and flexing. It is ideal for conveying ores, stone, coke, glass cullet and other highly abrasive materials.

PHYSICAL PROPERTIES

Stacker exceeds British Standards Grade "A" in all requirements of fabric and rubber and may be used at temperatures up to 200 deg. F.
Made with the highest grade friction stock between plies for maximum flex-life.
Has the toughest cover obtainable, with the highest possible resistance to cutting, gouging and abrasion.
Completely inhibited against mildew damage.

AVAILABLE

Stacker is available in 28, 32, 36, 42 and 48 oz. duck weights, from 3 to 9 plies and in a full range of widths, lengths and cover gauges.

STYLE ORS

APPLICATIONS

For operations where extreme resistance to oil is necessary. Especially suitable for carrying oil-sprayed co
meat, fish or food where an

PHYSICAL PROPE

STYLE HRS

APPLICATIONS

Specially made for conveying hot, highly abrasive materials when the combination of resistance to high temperatures, extreme abrasion and severe flexing are essential.

PHYSICAL PROPERTIES

The carcass, cover and skim-coating between plies give all the heavy-duty characteristics of a Grade "A" belt

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CONVEYOR BELTING · TRANSMISSION BELTING · V-BELTS · HOSE · FENDERING

Raw Material Markets

Iron and Steel

Business at most of the ironfoundries follows on the pattern of recent weeks, with overall output of castings at a fairly satisfactory level, although the present demands from all sections of the trade are easily satisfied and deliveries are up to schedule. Orders now being placed are for about the same tonnages, but for the engineering and speciality foundries which supply to the motor vehicle trade some increase on previous delivery schedules has been received and, as stocks of castings diminish, larger demands are expected. The steady improvement in trade which is expected will have a corresponding effect on the demand for pig-iron, particularly in the low-phosphorus and hematite grades. Makers are able at present to satisfy all demands from regular users and, although in some instances production has exceeded usage, stocks are not large and would be absorbed quickly by even a slight percentage overall increase on the present intake. Other users of these pig-irons continue to order good tonnages for the production of high-duty castings for many trades.

The light-castings trades continue to specify only moderate quantities of castings and the light foundries are, in consequence, only partially employed. Some are better off than others, depending on the type of castings produced, but generally there is plenty of room for improvement. Jobbing foundries, which cater for many trades are fairly busy, but textile foundries are in need of more work. The high-phosphorus pig-iron which these foundries use is in good supply and, although production of this grade has been still further reduced by the blowing in of a furnace in the Derbyshire area for relining, the foundries will not suffer as there is more than sufficient of this iron available.

Apart from hematite pig-iron which is not being exported, merchants have numerous inquiries for other grades from customers abroad, and there appear to be tonnages to spare which could be booked at satisfactory prices if licences could be obtained. In areas affected by the strike there have been some suspensions in deliveries of castings, and in the Derbyshire area two blast furnaces have been damped down, resulting in a loss in output of basic pig-iron for the steelworks of several thousand tons each week. Production in that area of high-phosphorus pig-iron has also been affected adversely.

The supply of scrap is at present satisfying the needs of the foundries which are also receiving adequate tonnages of foundry coke, ganister, limestone, and firebricks.

The re-rollers generally maintain fairly good outputs, but in the English Midlands there is some reduction in demands for small bars and light sections. Stockholders appear to have good tonnages on hand and there is less business being placed by them, while there is also a decline in orders from consumers. To make matters worse, some consumers were forced to suspend deliveries on account of the engineering strike. Deliveries of semis from home steelworks continue on a good scale and all available supplies are readily accepted, stocks having been reduced considerably.

Non-ferrous Metals

Although the strike at Mufulira in the Northern Rhodesian Copperbelt was settled last weekend, the general unrest on the Copperbelt, the continuance of the strike at El Teniente in Chile, and the threat of a strike at Noranda (called off at the last minute) have done much to keep the copper price firm. However, now that work has been resumed in the shipbuilding and engineering industries and the gold and dollar reserves increased in March, confidence in the outlook has improved. Trading in front of the Budget was slow.

In the United States demand is better—noticeably so. This is partly attributable to the strikes and the firmer London price, but also to the improved employment figures for March—nearly 1,000,000 higher—the record levels of personal income announced for February, and the upturn in demand for automobiles in March. Scrap prices are harder, though this has coaxed little metal onto the market, custom smelters and producers are holding their prices at 32 cents, and export business is being carried out at 31 cents a pound. Because of the current confusion on both sides of the Atlantic concerning the role of the US Government in respect of copper stockpiling, the US Commerce Department has announced that the absorption of copper under the Defence Production Act would be in the neighbourhood of 4,000 short tons a month if the price dropped below 29 cents a pound and 10,000 short tons if the quotation went under 27 cents a pound. This may or may not be all there is to the much vaunted hopes placed in US stockpiling of copper; the announcement certainly falls short of a clear explanation as it excludes any reference to contracts previously placed or terminated or under option for the purchase of the metal.

Tin in London, in the face of the prospect of improved supplies now that the Suez Canal is opened and indifferent demand, is holding up well. At the present LME price the buffer stock manager can buy metal, but the general belief is that he will not do so with the price so near the top of its range. One thing assured is that it is highly unlikely that the price of tin will now drop below £730 a ton, the new floor price. In the United States demand has fallen off and with it the price which is now well below the $1.00 a pound level. World consumption of tin last year—excluding the USSR—was 160,500 tons, against 154,500 tons in 1955. The US took 60,700 tons (against 59,828 tons) and the UK 22,232 (22,873) tons.

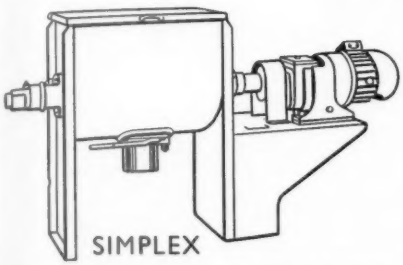
Lead is quiet in London and quietly steady in New York. Price movements on the LME are narrow and steady in America at 16 cents a pound. The outlook is better now that derationing of petrol is thought to be imminent.

Zinc is a good market on both sides of the Atlantic. Demand for both ordinary and high-grade metal is noticeably better and with the revival of automobile buying in the States the outlook for an improvement in the statistical position is bright. The demand in London, some observers think, is connected with purchases for spot supplies to meet barter transaction commitments. In any event, the backwardation is around £4 a ton. In the US the price remains at 13½ cents a pound, East St. Louis.

Nickel Steels are Dearer

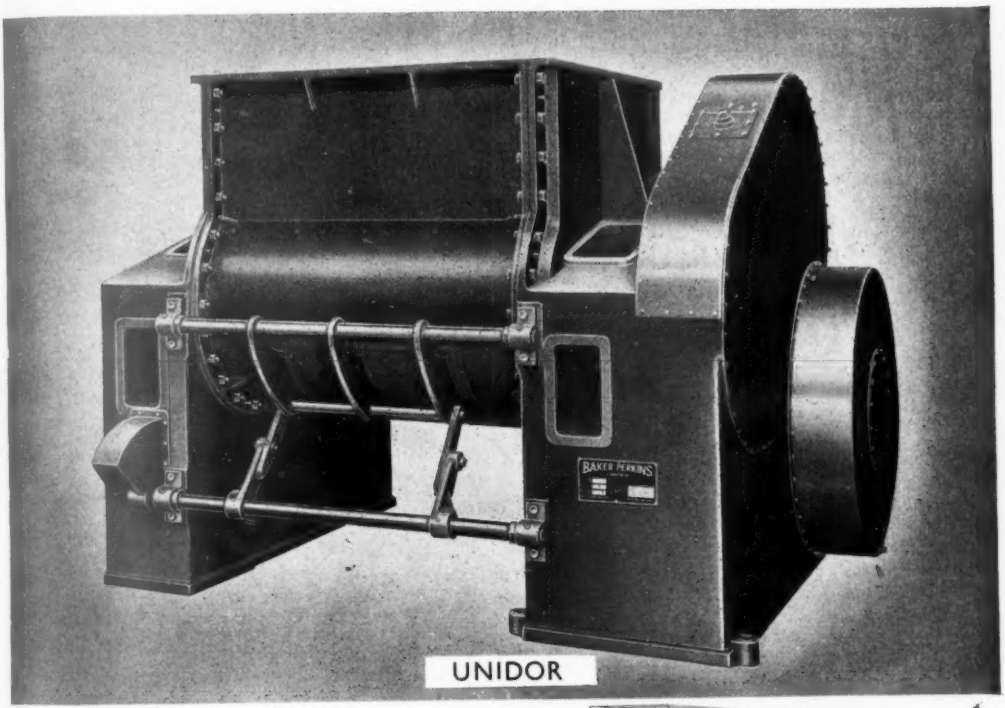
Higher prices for nickel and vanadium bearing steels came into force last week. The increases, the Iron and Steel Board states, are necessary to cover the higher cost of the alloying materials.

The maximum price of austenitic stainless steel has been raised by £10 to £293 per ton. Alloy steel specification EN10, which contains 0.75 per cent. nickel, is now £65 10s. 3d. a ton, an increase of 16s. 6d., while EN27 (3 per cent. to 3.75 per cent Ni) is £3 17s. 9d. dearer at £104 11s. 6d.


SIMPLEX

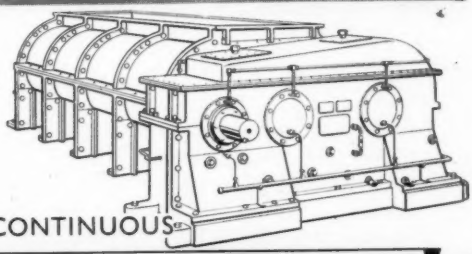
Batch and Continuous Sand Mixers

IN A RANGE OF SIZES UP TO 300 TONS AN HOUR



UNIDOR

Both "UNIDOR" and "CONTINUOUS" machines subject the sand to perfect milling action between their twin shafted, helical, contra-rotating sigma blades. Other mixers in all sizes are supplied for core sands, pre-coated resin sands and CO_2 mixes.


CONTINUOUS

BAKER PERKINS LIMITED

ENGINEERS

WESTWOOD WORKS · PETERBOROUGH

Current Prices of Iron, Steel, and Non-ferrous Metals

(Delivered unless otherwise stated)

April 10, 1957

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2:—Middlesbrough, £20 1s. 0d.; Birmingham, £19 13s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £21 18s. 0d., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si), d/d within 60 miles of Stafford, £22 2s. 3d.

Scotch Iron.—No. 3 foundry, £23 4s. 6d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £24 6s. 6d.; South Zone, £24 9s. 0d.

Refined Malleable.—P, 0.10 per cent. max.—North Zone, £25 14s. 0d.; South Zone, £25 16s. 6d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent.:—N.-E. of England (local iron), £22 17s. 6d.; Scotland (Scotch iron), Zone S. 1, £23 4s. 0d.; Sheffield, £24 4s. 6d.; Birmingham, £24 12s. 0d.; Wales (Welsh iron), £22 17s. 6d.

Basic Pig-iron.—£19 3s. 0d. all districts.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £50 0s. 0d. to £53 5s. 0d., scale 17s. 0d. to 17s. 6d. per unit; 75 per cent. Si, £70 0s. 0d. to £76 7s. 6d., scale 17s. 0d. to 17s. 6d. per unit.

Ferro-vanadium.—50/60 per cent., 28s. 6d. per lb. of V.

Ferro-molybdenum.—65/75 per cent., carbon-free, 12s. 3d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., carbon-free, £250 0s. 0d.; 38/40 per cent., £299 0s. 0d.

Ferro-tungsten.—80/85 per cent., 12s. 4d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 15s. 4d. per lb. of W.

Ferro-chrome (6-10 ton lots).—4/6 per cent. C, £96 0s. 0d. to £99 10s. 0d., basis 60 per cent. Cr, scale 33s. 0d. per unit; over 6 per cent. C, £94 0s. 0d., basis 60 per cent. Cr, scale 31s. 0d. to 33s. 0d. per unit; 2 per cent. C,* 2s. 2d. per lb. Cr.; 1 per cent. C,* 2s. 2½d. per lb. Cr; 0.15 per cent. C,* 2s. 3d. to 2s. 3½d. per lb. Cr; 0.10 per cent. C,* 2s. 3½d. to 2s. 3¾d. per lb. Cr; 0.06 per cent. C,* 2s. 3¾d. to 2s. 4d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 7s. 0d. to 7s. 6d. per lb.

Metallic Manganese.—90/92 per cent., carbon-free, £290 0s. 0d.; 96/98 per cent., £310 0s. 0d.

Ferro-columbium.—65/75 per cent. Nb + Ta, 22s. 0d. to 23s. 0d. per lb., Nb + Ta.

Ferro-manganese (home).—78 per cent., £82 12s. 6d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft, u.t., £30 9s. 0d.; tested, 0.08 to 0.25 per cent. C, £31 9s. 0d.; hard (0.41 to 0.60 per cent. C), £32 10s. 6d.; silico-manganese, £41 0s. 0d.; free-cutting, £34 13s. 0d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £38 4s. 6d.; silico-manganese, £41 7s. 6d.

* Average 68-70 per cent.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.25 per cent. C, £36 3s. 6d.; basic, hard, over 0.41 up to 0.60 per cent. C, £37 6s. 0d.; acid, up to 0.25 per cent. C, £40 7s. 6d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £39 2s. 0d.; boiler plates (N.-E. Coast), £41 12s. 0d.; floor plates (N.-E. Coast), £40 11s. 0d.; sectional material, N.-E. Coast, £37 11s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., untested (4-ton lots), £37 18s. 0d.; flats, 5 in. wide and under (4-ton lots), £37 18s. 0d.; hoop and strip, £37 17s. 6d.; uncoated strip mill coils, hot rolled, under 3mm. to 12g., £41 6s. 0d.; black sheets (hand mill), 17/20 g., £52 4s. 6d.; galvanized corrugated sheets, 24 g., £65 9s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £65 10s. 3d.; nickel-chrome, £92 13s. 0d.; nickel-chrome-molybdenum, £104 11s. 6d.

NON-FERROUS METALS

Copper.—Cash, £241 10s. 0d. to £241 15s. 0d.; three months, £242 0s. 0d. to £242 10s. 0d.; settlement, £241 15s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 2s. 4¾d. per lb.; rods, 274s. 0d. per cwt. basis; 20 s.w.g., 307s. 3d. per cwt.

Tin.—Cash, £772 0s. 0d. to £773 0s. 0d.; three months, £765 0s. 0d. to £766 0s. 0d.; settlement, £773 0s. 0d.

Lead (Refined Pig).—First half April, £113 5s. 0d. to £113 10s. 0d.; first half July, £112 10s. 0d. to £112 15s. 0d.

Zinc.—First half April, £98 15s. 0d., to £99 0s. 0d.; first half July, £94 15s. 0d. to £95 0s. 0d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £130 15s. 0d.; rolled zinc (boiler plates), all English destinations, £128 10s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £105.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 11⅞d. per lb.; rods, drawn, 2s. 11d.; sheets to 10 w.g., 206s. 6d. per cwt.; wire, 2s. 8¼d.; rolled metal, 206s. 6d. per cwt.

Brass (Brazing).—BS1400, B3 (65/35), £179; B6 (85/15), £218; BS249, —.

Brass (High Tensile).—BS1400, HTB1 (30 tons), £230; HTB2 (38 tons), £235; HTB3 (48 tons), —.

Gunmetal.—BS1400, LG2 (85/5/5/5), £238; LG3 (86/7/5/2), £250; G1 (88/10/2/½), £299; (88/10/2/1), £290.

Phosphor Bronze.—BS1400, PB1 (AID released), £312 per ton.

Phosphor Bronze Strip, etc.—Strip, 297s. 3d. per cwt.; sheets to 10 w.g., 290s. 0d. per cwt.; wire, 4s. 0½d. per lb.; rods, 3s. 3¾d.; tubes, 3s. 4½d.; chill cast bars: solids 3s. 4d., cored 3s. 5d. (CHARLES CLIFFORD, LIMITED.)

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 10d. per lb.; round wire, 10g. in coils (10 per cent.), 4s. 2¾d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 4s. 1¾d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 5½d. per lb. Antimony, English, 99 per cent., £210 0s. 0d. Quicksilver, ex-warehouse, £86 0s. 0d. Nickel, £600 0s. 0d. Aluminium ingots, £197 0s. 0d.; aluminium bronze (BS1400), AB1, £266; AB2, £285. Solder, brazing, BS1945, type 8 (50/50), — per lb., type 9 (54/46), — per lb.